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PHILIPPINE FOREST WEALTH

AN OPPORTUNITY, WITH PROPER CONSERVATION TO MAKE THE ISLANDS' TIMBER LANDS STEADILY INCREASE IN VALUE

By Dean C. Worcester

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THE land area of the Philippines is approximately 115,000 square miles of which no less than 40,000 are still covered by virgin forests, while second growth forests, of greater or less value, hold possession of an additional 20,000. All but an insignificant fraction of this vast area belongs to the public domain and public forest lands can be acquired for agricultural purposes only upon a proper certificate from the director of forestry that they are more valuable for agriculture than for forest purposes.

They produce timber, cabinet woods, and other valuable forest products in great abundance and endless variety, and the Philippine stand of hard wood is undoubtedly one of the most important remaining in the world. More than 2,500 tree species have now been identified.

Notable among the very valuable structural timbers is *molave*, which has a grain of such nature that it can hardly be split. It is practically impervious to the attacks of "white ants" and is capable of resisting the injurious effects of the tropical sun and rain for centuries. Let anyone who doubts the strict accuracy of this statement examine the forts, now falling into ruins, built long ago for defense against the Moros, or the window sills of the oldest buildings in the city of Manila. Numerous other woods, admirably suited to structural work of all kinds, including the handsomest and most durable inside finishing, are to be had in great abundance. There are many cabinet woods which leave nothing to be desired in beauty, workability and durability. It is a thousand pities that some of these, like red *lauán*, should have been introduced into the markets of the United States under such misleading designations as "Philippine mahogany." The woods which most nearly approach mahogany in color and texture are red *nárra* and *tíndalo*, each of which is quite good enough to be known under its own name.

Good matchwood is produced in abundance. *Palma brava* makes fine bows and fishrods. *Máncono* is an excellent substitute for lignum-vitae. I once began the preparation of a memorandum on the several uses to which I had seen bamboo put, but after writing quite steadily for three days gave up the task on which I had then made only a fair beginning. One of the common bamboos produces an excellent paper pulp and doubtless a number of tree species would be available for this use.

Dye woods are to be had in considerable abundance. There are good stands of gutta-percha trees at various points in the southern islands. The pitch of the pine trees which cover great areas in Northern Luzon is exceptionally rich in turpentine and there are numerous other valuable gums and rosins of which the most important is damar, locally known as *almáciga*, used in making

TYPICAL FILIPINO HOUSES.

SHOWING THE MIXED CONSTRUCTION OF BOARDS AND BAMBOO WITH NIPA PALM THATCH. THE BETTER HOUSES HAVE IRON ROOFS AND ARE BUILT OF WOOD THROUGHOUT. THE POORER ONES ARE CONSTRUCTED CHIEFLY OF PALM LEAVES OR GRASS AND BAMBOO.

varnish. The damar of commerce is a fossil gum, dug from the earth, but the trees which produce it exist in abundance today and are steadily sending their flow of gum into the ground for the possible benefit of future generations.

Extensive mangrove swamps lining many of the more sheltered shores for long distances produce the best of fire wood and good tan bark. Valuable orchids are abundant in many of the damper forests.

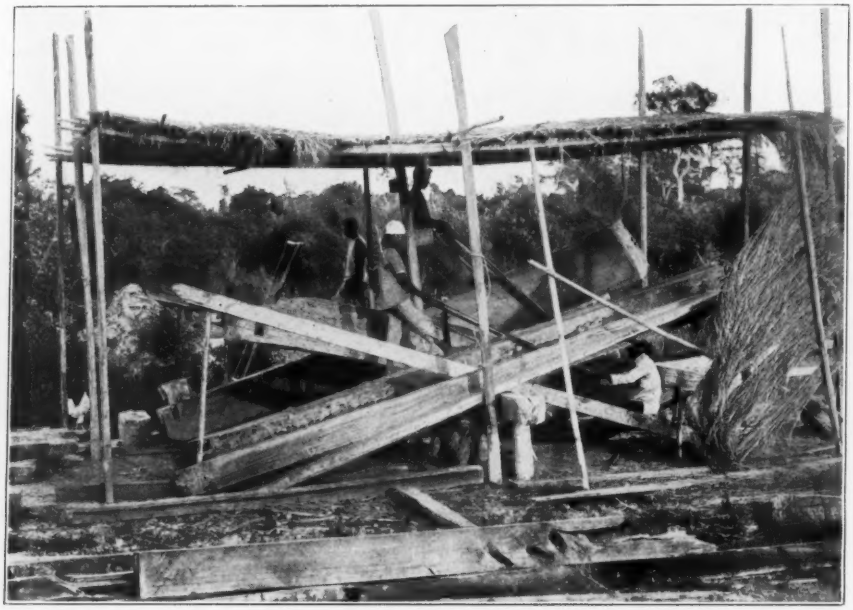
The nuts of the lumbang tree are rich in a valuable drying oil, utilizable in mixing paints and varnishes, and pili nuts have now become an article of commerce and are beginning to find their way to the tables of the people of the United States. I know of no other nuts which, when fresh and properly roasted, are so delicious or so tender.

In view of the indifference which we ourselves have shown towards the conservation of our own forest resources in the immediate past we should not wonder that the Filipinos, by which term I designate the Christianized-civilized residents of the archipelago, should still be utterly indifferent to the preservation of their forests as a permanent source of wealth. Much less would a similar attitude on the part of most of the wild tribes afford ground for surprise, and it is indeed extraordinary that two of the latter peoples, the Lepanto Igorots and the Bontoc Igorots, should have been the only inhabitants of the archipelago to appreciate the importance of conserving their forests and should have promulgated and enforced rules to accomplish this result, yet such is the case.

On my first trip to Cayan, Tadian and Bagnin in Lepanto I was struck by the

SOME PRIMITIVE ADVOCATES OF FOREST CONSERVATION.

THESE PEOPLE BELONG TO THE TRIBE KNOWN AS THE BENGUET-LEPANTO IGOROTS. ALTHOUGH THEY ARE NOT VERY FAR ADVANCED IN CIVILIZATION, ONE SECTION OF THE TRIBE HAS LEARNED, BY HARD EXPERIENCE, THE VALUE OF FOREST CONSERVATION AND HAS INAUGURATED A PRIMITIVE SYSTEM WHICH INCLUDES THE PROTECTION OF YOUNG GROWTH FROM GRASS FIRES.



AN OLD STYLE SAW MILL.

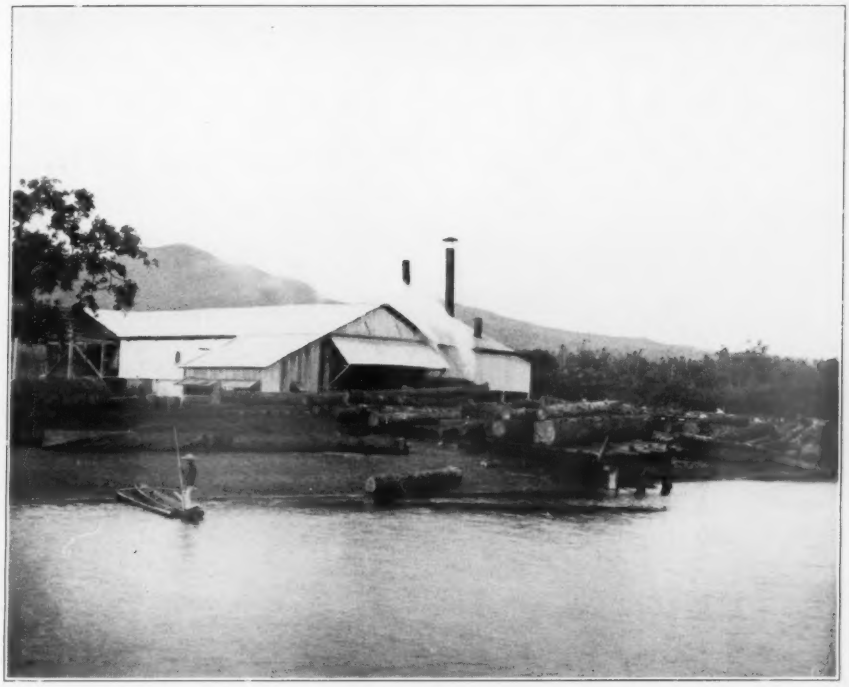
NOTE HOW THE HEAVY HARDWOOD LOGS WERE CUT INTO BOARDS BY MAN POWER SOMEWHAT IN THE SAME WAY THE WORK IS DONE IN SOME DISTRICTS OF CHINA TO THIS DAY.

peculiar appearance of many pine trees from which all of the branches, except a few at the top, had been carefully cut. I found that the individual trees were all "owned" but that the owners were not allowed to fell them until they had attained a certain minimum size, although they might meanwhile cut the lower branches for firewood. Noting the excellent reproduction which was occurring on some of the hillsides I found upon inquiry that the young trees were being protected from grass fires.

Unfortunately similar wisdom has not been displayed by the inhabitants of any other region in the archipelago and wanton forest destruction has been practiced, with little interference, from the time of the Spanish discovery until the American occupation.

One might suppose that the sparse population of the islands could at the worst make comparatively little impression on their vast forests. Unfortunately this is not the case. The islands produce several rank tropical grasses commonly known collectively as *cógon*, the wind-driven seeds of which fly for long distances and promptly germinate in land cleared for agricultural purposes. It has been difficult successfully to combat them with such machinery and implements as have heretofore been available, and for untold centuries there has prevailed the custom of obtaining land for agriculture by felling and burning the forest trees. Newly cleared lands have been abandoned as soon as *cógon* made its appearance. This pest is more than capable of holding its own against all comers. Its wide-spreading and sharply pointed roots not only make the soil acid but bore through any moderately soft obstacles which they encounter. Furthermore, *cógon* burns readily and fiercely during the dry season, destroying any young trees which may have established themselves, with the result that a deforested area which becomes a *cogonál* remains a *cogonál* unless man intervenes.

He is now intervening in the Philippines with legislation forbidding the



A Modern Saw Mill.

FIRST CLASS STEAM MILLS, THOROUGHLY UP TO DATE, ARE NOW IN OPERATION ON THE MORE IMPORTANT TIMBER CONCESSIONS IN THE PHILIPPINES.

making of unauthorized *caiñgins*, or forest clearings, and with motor-drawn plows and disc harrows, which make short work of *cógon* roots.

Unfortunately incalulable damage has already been done. The great island of Cebu is practically deforested and extensive areas on other islands have suffered a similar fate with the result that in these regions firewood is scarce and dear, structural timber is almost unobtainable save by importation, and the run-off of surface water after rainfall is altogether too rapid, so that stream-beds are filled with rushing torrents one week and are dry the next.

But the damage has not ended here. In cutting *molave* and other especially valuable timbers, the Filipino has had no thought for the morrow. The desirability of leaving trees for reproduction has not occurred to him, and as a result there are extensive areas near tidewater from which the more valuable tree species have been practically eliminated.

The Spaniards established a forest service, known as the Inspección de Montes, but its officers made little attempt to stop forest destruction, contenting themselves with collecting revenues which were chiefly derived from the timber cut and used locally for house construction.

Prior to the American occupation only one sawmill which was in any sense modern had been established, and the most primitive lumbering methods prevailed.

The narrow bitted Malay ax was used for all cutting operations. Wood cutters stood on platforms high above the ground in order to avoid the thickenings of the trunks near the roots and in consequence stumps were wastefully high. In felling no effort was made to avoid possible injury to other trees or young growth. Logs

PHILIPPINE SAIL BOATS.

BOATS OF THIS SORT, HEWN FROM SOLID LOGS AND PROVIDED WITH BAMBOO OUTRIGGERS TO PREVENT THEM UPSETTING, ARE IN GENERAL USE THROUGHOUT THE ISLANDS.

were transported on land by *carabao** power without even putting shoes under their forward ends. The great weight of many of the hardwoods made it impossible to handle in this way logs of any size, with the result that the sawing into lumber which was almost invariably carried on by hand, often took place where the trees were felled. Hardwood logs near streams were sometimes transported considerable distances by water after being buoyed up with bamboo to prevent their sinking.

Fortunately these primitive but destructive lumbering operations were limited to a comparatively small number of tree species, and many others of value were spared because their properties were unknown.

The necessity for changing the conditions above outlined was so obvious as to lead to very early action on the part of the military authorities. They promptly established a bureau of forestry in charge of Major George P. Ahern who had not only practical experience in forest work but foresight, imagination and boundless optimism as well. Major Ahern is still in charge of forest work in the Philippines, and is now in length of service the oldest of the bureau chiefs of the insular government. He has certainly needed all his optimism for he has been obliged to face many discouragements. Hampered as he was at the outset by inadequate funds and by the lack of men experienced in tropical forestry, the building up of an efficient field force presented grave obstacles which were met in part by bringing out young and enthusiastic but inexperienced forestry men from the United States and letting them get their experience on the ground; in part by training Filipinos for subordinate positions. At first the latter class of employes received only such training as could be given them in the field, but when the college of agriculture was established regular courses in forestry

* The Philippine name for the water buffalo.

ON THE EDGE OF THE OPEN.

NOTE THE SYMMETRICAL TRUNKS OF THE TREES, AND THE HEAVY UNDERGROWTH EXTENDING TO THE VERY EDGE OF THE CLEARED FIELD SEEN IN THE BACKGROUND.

were duly provided for and an exceptionally fine body of young Filipinos are now being trained up for this important branch of the government service.

One of the most serious difficulties which confronts the lumberman in the tropics arises from the fact that few of the tree species are to be met with in clean stands. In the Philippines the mangrove along swampy coasts, the pines and oaks of the highlands and some of the dipterocarps afford exceptions to this rule which is nevertheless general. One very important branch of the work of the bureau of forestry has been to determine and to demonstrate the commercial value of the wood of a number of common tree species which had not previously been marketed. To this end important laboratory investigations were successfully conducted.

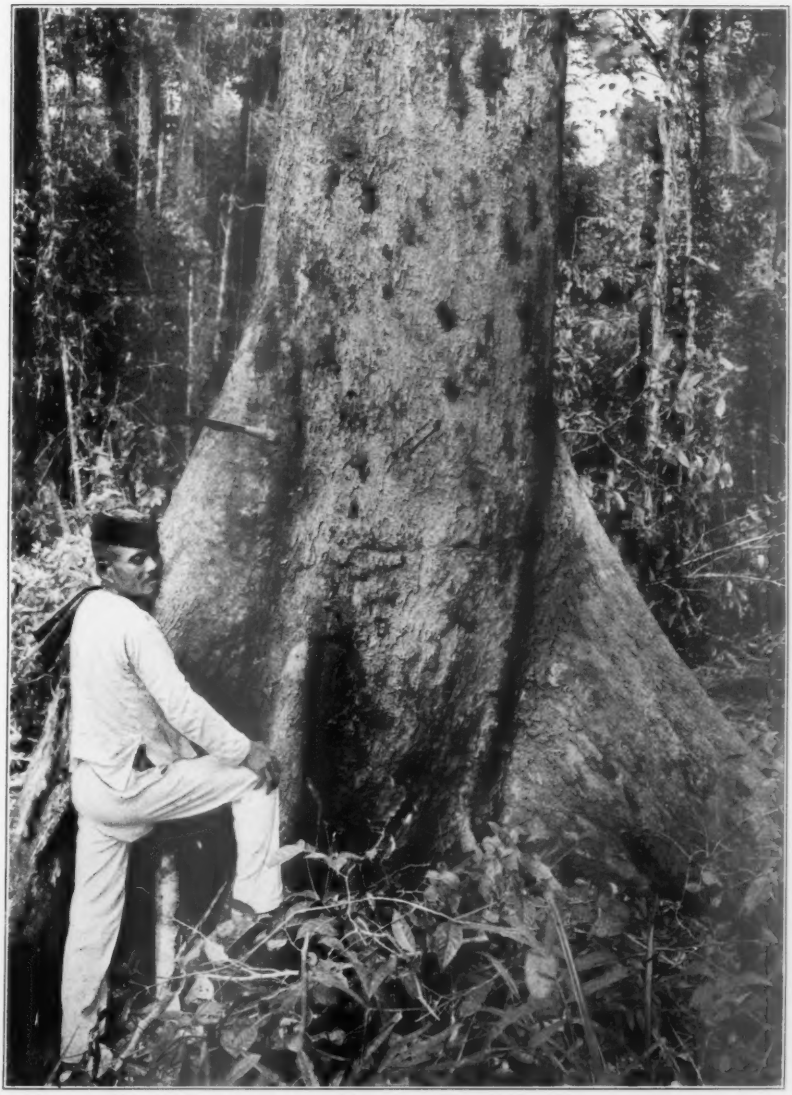
The completion of this work rendered possible the making of forest studies to determine the value of the stands on sample acres throughout extensive tracts, and the information thus gained, supplemented by reliable data relative to existing means of transportation and the possibility of bettering them, afforded an adequate foundation for a publicity campaign which has been persistently waged with a considerable degree of success.

The first lumbermen who attempted to introduce modern machinery and methods found that they had much to learn, especially in the matter of milling logs. Many of the hard woods are difficult to work and feeds had to be cut down to avoid stripping the teeth from the saws. Indeed up to the present time it has proved impracticable to use band saws successfully in milling the harder woods. Little by little the skidding engine and the logging railway took the place of the slow-moving *carabao* and up-to-date methods are now firmly established.

Philippine forest lands are not subject to alienation. Wood cutters pay a very moderate stumpage tax. Many lumbermen work under annual licenses which may or may not be exclusive, but such an arrangement would of course not justify the investment of large capital in the construction of logging roads or the installation of expensive machinery, and persons wishing to operate on a large scale are granted twenty-year license agreements covering tracts as large as they can reasonably be expected to utilize during the time the licenses run. Such concessions are in each case granted to the highest and best bidder after being duly advertised. They cost nothing, the "bid" covering such items as the amount to be invested, the value and character of the plant to be installed, the time within which operations will begin, the scale on which they will be conducted, the guaranteed minimum annual cut, and in some instances the percentage of the total cut which will be offered for sale to the public and the maximum

HAULING LOGS IN THE PHILIPPINES.

THIS METHOD IS AN IMPROVEMENT OVER DRAGGING THEM ON THE GROUND BUT IT HAS ITS DRAWBACKS AS THE PHILIPPINE HARDWOODS ARE HEAVY. NOTE THE SOLID WOODEN WHEELS OF THE CART.



TYPE OF KALUNTI-LAUAN.

ONE OF THE FAMOUS WOODS OF THE PHILIPPINES AND WHICH IS EXPECTED TO BECOME VERY POPULAR WHEN IT IS BETTER KNOWN.

prices which will be charged. Special attention was given to these last two items in connection with concessions covering forest tracts near Baguio, the summer capital, where the supply of timber is limited and there would be a possibility of monopolization with resulting high prices were the interests of the public not adequately safeguarded.

There is a clause in each contract providing for its cancellation in the event that its beneficiaries fail to live

up to its conditions, the fulfillment of which is further safeguarded by the requirement of a cash bond.

In many instances the Bureau of Forestry has assisted lumbermen by preliminary field studies and by advice as to the methods which should be employed in field and milling operations, and the development of the lumber industry has been rapid, especially during the last few years, the annual cut being 77,585,180 board feet in 1911; 95,377,925 in 1912 and 112,360,000 in 1913. The officials of the Forest Service say that ten times the latter amount might be removed from the public forests annually without diminishing their productivity.

The Director of Forestry is vested with adequate authority to control all cutting operations so as to prevent needless destruction and to provide adequately for the reproduction of the more important tree species, with the result that in many instances lumbering operations have resulted in actual improvement of the forest areas affected. If the present policy is steadily adhered to the public forests of the Philippines can be made a permanent source of great wealth to the people and of revenue to their government.

From the outset preferential attention has been given to protecting the interests of the individual. The old Spanish charges on timber to be used for house construction or other non-commercial purposes have been entirely done away with. Even in the areas covered by "exclusive" concessions, neighboring residents are granted the right to obtain, free of charge, fuel and timber for their personal use, but many Filipinos have bitterly resented the restriction of the wanton destruction of valuable timber by the making of needless *caiñgins*. Only a very few of the most enlightened give a thought to the future or see any real need of conservation. They wish to take from the public forest whatever

ONE METHOD OF HAULING LOGS.

WHILE THIS IS THE WAY THIS WORK WAS DONE MANY YEARS AGO THE SAME METHOD IS IN COMMON USE TODAY.

TYPICAL FOREST SCENE IN THE PHILIPPINES

IT SHOWS THE ROOTS OF THE BALETE TREE. THE TREES OF THIS SPECIES ARE GENERALLY BELIEVED THROUGHOUT POLYNESIA TO BE THE ABODES OF SPIRITS AND IN THE TERRITORY OF THE MORE BACKWARD PEOPLES OF THE PHILIPPINES IT IS SOMETIMES DIFFICULT TO GET THEM REMOVED WHEN THEY INTERFERE WITH ROAD CONSTRUCTION.

they require, without payment and without limitations of any sort. In many instances the maker of the unlawful *caiñgin* is a poor native employed by a rich one. If detected he is left to pay the penalty for his wrong conduct; otherwise the land cleared is eventually incorporated with that of the rich neighbor who hired him to violate the law. It is therefore needless to say that the work of the forestry bureau has not been popular with the Filipinos.

Many of the lumbermen in the Philippines are, like many lumbermen elsewhere, not in favor of any restrictions on cutting operations, and inclined to disregard future advantage for present gain, so it has resulted that the Philippine Forest Service, which helps lumbermen and the public alike, has been rather short of friends.

Under the plea of economy and of the need of a more equitable division of the funds of the government between bureaus, the annual appropriation for the support of its work was greatly reduced

AMONG THE BENGUET PINES.

A SAMPLE OF THE ADMIRABLE ROADS CONSTRUCTED UNDER THE UNITED STATES ADMINISTRATION.

some years since. An unsuccessful effort was made at that time to have it consolidated with the bureau of agriculture, and it has since had to struggle to justify its existence as a separate entity

As the executive official exercising control over it, I sought to accomplish two things. The first was to demonstrate that its continued existence was justified on financial grounds, regardless of the importance of preventing wasteful forest destruction, by the increase in insular revenues which resulted from its activities in stimulating healthful development of the lumber industry, and in assisting the bureau of internal revenue to collect the amounts due the government from lumbermen.

My efforts in this regard met with a considerable degree of success. I was at first refused an increased appropriation necessary if officers of the Forest Service were to be sent into the great island of Mindanao, where practically unrestricted cutting operations were being conducted, and was advised that I could in my own discretion take such officers from other places where they were then employed and put them into this territory if I felt that their presence there would result in profit to the government. I acted upon this suggestion and the increase in forest revenue from Mindanao within a year was such as fully to demonstrate the correctness of my contention. This brought a small permanent increase in the working force of the bureau.

WHERE THE TABLE TOPS COME FROM.

THE PHILIPPINES ARE FAMOUS FOR THEIR BEAUTIFUL SINGLE PIECE TABLE TOPS OF RED NARRA. THEY COME FROM GREAT BATTERED ROOTS LIKE THE ONE HERE SHOWN OR LARGER.

THE LAUAN-HAGACHAE TYPE.

THIS INDICATES IN SOME MEASURE THE DIFFICULTIES OF GETTING TIMBER OUT OF THE HEAVY FORESTS, BUT THE OPENING UP OF DISTRICTS BY THE CONSTRUCTION OF GOOD ROADS IS GRADUALLY MAKING MUCH OF THE TIMBER AVAILABLE.

The second thing which I sought to secure was the setting aside of a definite proportion of the forest revenues for the work of the Bureau of Forestry. This I deemed to be a matter of fundamental importance, for as the lumber industry of the Philippines grows the necessity for augmenting the force which supervises cutting operations increases, while the making of careful forestry studies and the preparation of working plans for great forest tracts promotes the healthful growth of the lumber industry, and a direct interest in forest revenues is calculated to stimulate the activity of the bureau of forestry in augmenting them.

The Upper House of the Philippine

WATER POWER GOING TO WASTE.

THE DEVELOPMENT OF HYDRAULIC POWER HAS HARDLY BEGUN IN THE PHILIPPINES. IT HAS GREAT POSSIBILITIES IN REGIONS WHERE FORESTED WATERSHEDS CAUSE A GRADUAL RUN-OFF.

legislature ultimately adopted this plan in practice, appropriating an amount equal to 10% of the revenue of the previous year for work in the special government provinces which were under its exclusive legislative control, and voting for the appropriation of an amount equivalent to 50% of these revenues for the work in the remainder of the archipelago.

It was reported that the Filipino Lower House favored the latter appropriation, but there was no opportunity to test the truth of this statement as during several successive years the two houses failed to agree on a new appro-

priation bill and the old one continued in effect.

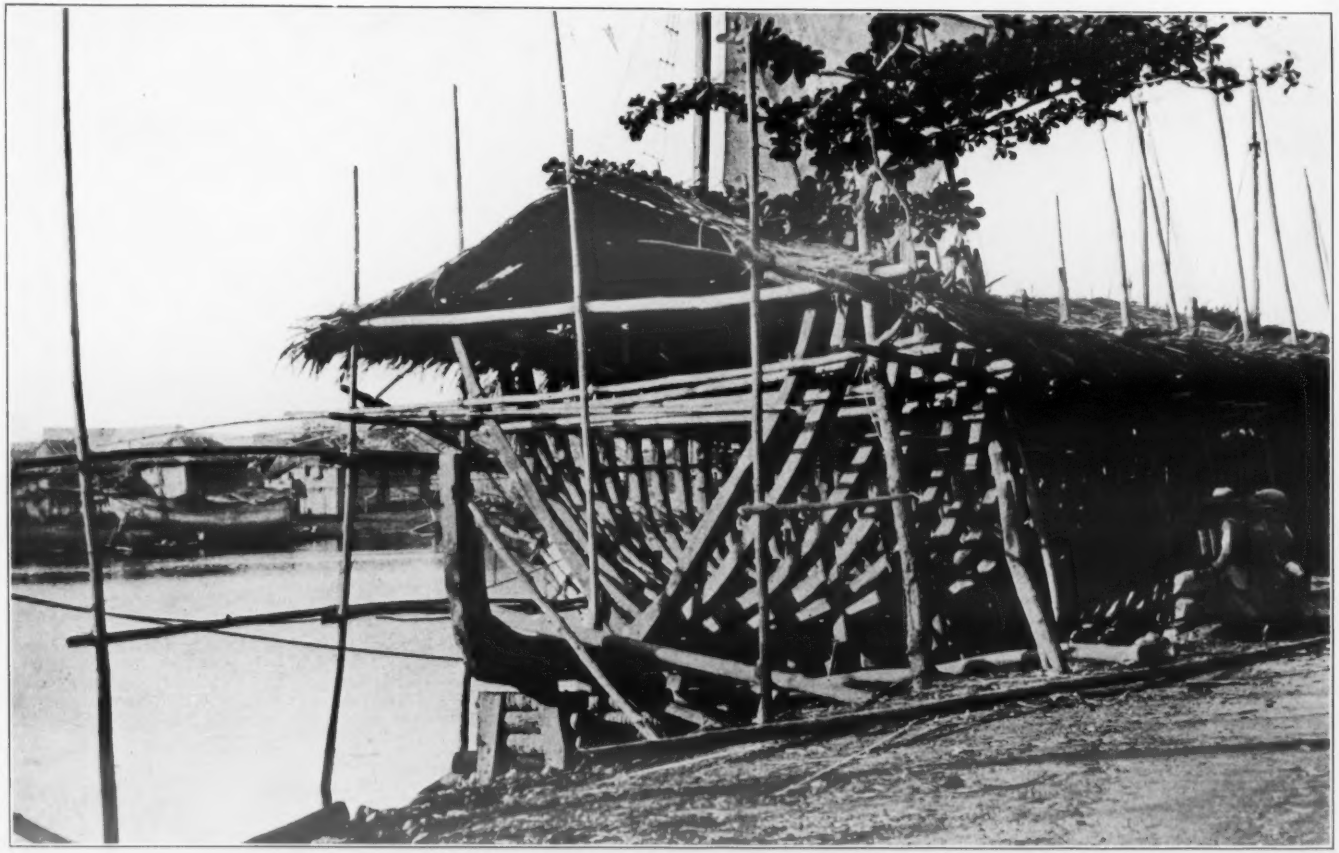
Unfortunately little faith can be placed in the willingness of the Lower House to support forest conservation. Its attitude clearly appeared in connection with recent efforts to secure important legislative reforms. Under existing provisions of law timber may be measured either in the round or after it has been manufactured into lumber. In actual practice the latter procedure is the one almost invariably followed, with the result that the government loses revenue on logs cut and abandoned in the forest and on those carried out to sea by floods while being transported by water. Wasteful manufacturing methods are encouraged, as there is no charge on what goes into slab piles. No charges are paid on lumber smuggled out of the yards and sold secretly or on that which is stolen from the yards or is burned or rots, for the reason that under the administration of a Filipino secretary of finance and justice, the bureau of internal revenue allows the mill men themselves to declare the amounts of lumber on which charges are due. Their declarations are not made until the lumber is shipped to market and there is no check on them except that afforded by the amounts of lumber actually received at the more important points of debarkation. This extraordinary administrative arrangement, not paralleled in the history of the American occupation of the Philippines, encourages fraud and unquestionably results in material loss of revenue, for although officers and employes of the bureau of forestry were finally made internal revenue officers for the purpose of enforcing collections, the exigencies of field service rendered it impossible for them to be stationed premanently at sawmills so as to perform the very large amount of work involved in measuring manufactured lumber as it comes from the saw. Measurements in the round could be easily and quickly made either in the forest or at the mill and an adequate check on operations of lumbermen could thus be established without materially augmenting the force of the bureau of forestry.

In view of these facts I drafted an act providing that timber should be measured in the round. It was thought that certain of the lumbermen would oppose this measure, but no opposition developed when the bill came up in the Commission and it was passed by that body. Unfortunately an effective bit of lobbying had been done meanwhile in the Lower House and that body promptly killed a measure which would have augmented materially the annual revenues of the government without interfering in the least with the legitimate operations of lumbermen.

The Philippine Assembly has not been content with obstructing the work of the Bureau of Forestry but has twice struck at its very existence. At the last session of the legislature it passed a bill transferring all forest work to the bureau of lands for which a Filipino chief had just then been appointed. Fortunately the Upper House has not yet become oblivious to the fact that the Act of Congress of July 2, 1902, fixed certain specific duties, of a very important character, for the director of the Bureau of Forestry and that the power of the Philippine legislature to defeat the will of Congress by abolishing his office is therefore decidedly doubtful.

In spite of the splendid service which the Bureau of Forestry has rendered in making practicable and encouraging the building up of a great lumber business in the Philippines and in augmenting the government revenues, its continued existence is probably due only to the fact that it does not at present lie within the power of Filipino politicians to do away with it. Let us hope that it will long continue to survive political vicissitudes.

Vastly more timber falls and rots annually in the Phillippines than is cut by all the lumbermen. The lumber at present manufactured is not sufficient in amount to meet the local demand, to say nothing of the possibility of building up a profitable export trade. Under proper supervision the public forests will steadliy increase in value and will become an important source of permanent wealth. Without such supervision deforestation will progress more



One of the Uses for Philippine Timber.

THE FORESTS FURNISH ADMIRABLE TIMBER FOR BOAT AND SHIP BUILDING. GOOD NATURAL CROOKS ARE READILY OBTAINED AND SOME OF THE NATIVES SHOW CONSIDERABLE SKILL IN THE CONSTRUCTION OF SHAPELY AND SEAWORTHY CRAFT. THE PICTURE SHOWS SHIPBUILDING UNDER WAY AT DAGUPAN, IN LUZON.

rapidly than ever before, as a direct result of the application of modern lumbering methods and of the strong stimulus which agricultural development has received. The value of the remaining forests will be diminished by the destruction of the more valuable tree species. It will become excessively difficult in many regions to obtain firewood and building materials. Conditions as to rainfall and run-off will be unfavorably influenced and the supply of water needed for irrigation during the dry season will be diminished.

It is too much to expect that the present generation of Filipinos should adopt adequate measures to provide against these dangers. The Congress of the United States should provide specifically for the continuance of the Philippine Forest Service so that the ignorance and extravagance of the present generation may not inflict irreparable loss upon the generations that are to come.

SELECTING SHADE TREES

By S. B. DETWILER

TREES are a constant inspiration to an appreciation of the beauties of nature; they cool the air in summer and temper the cold winds of winter. They furnish a nesting place and shelter for birds and counteract the adverse conditions of city life. They purify the air, encourage outdoor life and have a vast educational influence upon the citizens, especially children. They enhance the beauty of architecture, increase the value of real estate, and conserve soil and moisture.

Through a love of the trees the people of the United States are beginning to comprehend the need not only for planting shade trees and protecting them, but for the protection and more rational use of our splendid forests.

The American Forestry Association is devoting its influence to the development of public thought and knowledge about trees and forests along practical lines.

This article is limited to general information about selecting shade trees.

To those who desire detailed advice concerning forestry problems or who are in need of a complete plan for forestry operations, the American Forestry Association is prepared to mail expert advice upon application.

Attention is also called to State forestry departments, State forestry associations and city foresters Departments from which reliable and unprejudiced information may be obtained. Those who desire to plan and direct their own forestry work are strongly urged to outline a definite and complete program of operations before the work is started. This will insure close attention to practical details and will help to avoid annoying mistakes.

SHADE TREES

The selection of species is a matter of primary importance in shade tree planting. In deciding this point the climatic and soil conditions and the location of the tree or the purpose for which it is desired must be considered. In the past the tendency has been to plant quick growing trees for immediate effect regardless of their qualifications. The results invariably have been highly unsatisfactory. In the lists given below are enumerated trees suitable for various purposes and planting sites. The trees printed in italics are those which are most desirable.

STREET TREES FOR PLANTING UNDER SEVERE CONDITIONS

Oriental Sycamore.—Hardiest of all for street planting, not liable to insects, rapid growth. Deep rooted, adapted to a great variety of soils. Will require pruning on narrow streets but stands pruning well. Should be planted from

40 feet apart in poor soil to 50 feet in the more favorable sites.

Norway Maple.—Very hardy, adapted to a variety of soils, has a regular compact crown, casts dense shade, requires little pruning. Plant 35 to 40 feet apart.

Red Oak, Pin Oak, Scarlet Oak.—Best oaks for street purposes; hardy, medium growth, moderate shade, fairly free from insects, should be spaced 40 to 50 feet apart. Red Oak is the fastest growing oak, has a wide-spreading crown, and is least fastidious in regard to soil and moisture. Scarlet oak has brilliant and persistent foliage in Autumn. Pin oak has a rather narrow, pyramidal head, and is best adapted to moist soil. It grows slowly at first but makes a good growth when well established. Oaks do not stand pruning well, and branches should be cut off at the trunk. Because pin oak branches droop more than other oaks, the branches must be pruned off far up the trunk to prevent interference with street traffic.

Gingko or Maidenhair Tree.—Hardy, adapted to poor soils, casts light shade, free from enemies of all kinds. Suited to narrow streets, but the head can be broadened by proper pruning. The fruit is objectionable, but only for a short time. Spacing about 30 feet.

Honey Locust.—Stands smoke well, adapted to almost any soil. Casts very light shade, good growth, fairly free from enemies. Should be planted sparingly. Spacing about 40 feet.

Ailanthus.—Young trees vigorous, of good appearance, but later become unsightly. Adapted to the most adverse conditions. Thrives in very smoky atmosphere and in poor soil. Male tree has obnoxious odor, so only female form should be planted. Sprouts freely from roots, but these can be controlled by cutting back. Should not be considered where other trees will grow. Spacing about 30 feet.

STREET TREES FOR PLANTING UNDER FAVORABLE CONDITIONS

American Elm.—A graceful tree, attractive in summer and winter. Tall and stately with strong arching branches. Grows rapidly in rich, well-drained, moist soil, but adapted to many soils. Should be planted only on wide avenues, 40 to 60 feet apart, according to soil conditions, usually about 50 feet. Very liable to attack by the elm leaf beetle. The English elm is smaller, more compact, not as graceful as the American elm, and more subject to insect attack.

Sugar Maple.—Very hardy but exacting in soil and moisture, and is sensitive to dust and smoke. Rounded symmetrical head, foliage colors brilliantly in autumn. Plant 40 to 45 feet apart.

European Linden. — Well formed, rounded head, with dense beautiful foliage, grows quite rapidly but requires good moist soil, and is very liable to insect attack. Should be spaced about 35 feet. The basswood or American Linden has larger leaves and is less valuable for street planting than the European species.

Tulip Tree.—Tall, very regular form, requires good soil. Hard to transplant on account of tender roots; best results if young trees are planted. Subject to scale and other enemies. On account of its great size, should be planted only on very wide streets and in suburban sections. Spacing 45 to 60 feet.

Red Maple.—Adapted to good moist soil, moderate growth, dense shade, fairly free from insects. Fine coloring in spring and fall. Space trees 35 to 40 feet apart.

Sweet Gum.—Best suited to very moist, rich soil. Has compact form, beautiful foliage, especially in fall. Very free from insects. Spacing about 35 feet.

White Ash.—Fairly rapid growth, hardy, suited to many soils. Grows straight and forms a round, symmetrical top. Leaves compound, and foliage in pleasing, irregular masses. Few enemies. Spacing about 40 feet.

Hackberry.—Medium sized, symmetrical tree, not exacting as to soil, moisture, or climate. Slow growth, but fairly free from pests and diseases. Spacing about 30 feet.

OBJECTIONABLE SPECIES FOR STREET PLANTING

All Poplars (Cottonwood, Carolina poplar, white poplar, Lombardy poplar, etc.).—Very rapid growth and require

constant cutting back. Wood soft, brittle, and limbs or tops frequently broken in storms. Surface roots raise flagstones and crack concrete walks, and the thick trunks push curb stones out of line. Fine rootlets clog drains, leaves fall during summer. Short-lived. Seed of female cottonwood objectionable.

Silver Maple.—Grows rapidly, but is short lived, and has brittle weak branches which break easily in storms. It is hard to prune and is affected by serious insect pests and fungus diseases.

Sycamore Maple.—Resembles the Norway Maple in habit of growth, but less desirable, and is subject to borers.

Box Elder.—Grows rapidly and under adverse conditions, but has a scraggy crown, branches easily broken, and twigs die readily; it is badly infested by insects, and the leaves start falling in summer.

Male Ailanthus.—The staminate or male flowers of Ailanthus produce a strong and highly disagreeable odor. This can be avoided by planting the female form of the tree.

Catalpa.—Common catalpa forms a short crooked trunk, and an irregular head. Not at all suited for street planting.

Hardy Catalpa is straight and with a well-formed crown, but requires good soil. Both species subject to enemies and are better as ornamental trees.

Horse Chestnut. — Leaves discolor, shrivel and fall in early summer. Subject to attacks of many insects and fungi.

The Conifers.—Are highly decorative for lawns and parks, but they cannot stand a smoky, dusty atmosphere, and the removal of the lower branches disfigures the trees.

FOR OTHER THAN STREET PLANTING

For private grounds and parks.—A great variety of trees may be used. Any tree native to the region or to regions of similar climate will grow if soil and moisture conditions are similar or if made equal by a change of soil. The species should be selected for its adaptability to existing soil and moisture conditions, and for its suitability, when full-grown, to the particular purpose for which it is desired—ornament, shade, protection, screen, etc. Time is well spent in observing the growth of the native and planted trees of the region.

Roadside trees.—All of the trees listed for street planting and many of those named for private grounds may be used. The selection of species and the spacing should be governed by the soil and local conditions, but care should be taken that the shading of roadway and adjoining property will not be detrimental.

GENERAL INFORMATION

Trees preferring wet soil.—Pin oak, Bald cypress, Oriental sycamore, Swamp white oak, Willow oak, Sweet gum, Red maple, White birch, Black ash, Tamarack, Willows and poplars.

Tall trees with large spreading crowns.—American elm, Tulip tree, Red oak, American sycamore, Honey locust, White oak, Horse chestnut, White ash, Black walnut.

Trees with narrow pyramidal crowns.—Ginkgo, Bald cypress, European larch, Norway spruce, Colorado blue spruce, Arbor vitae, Red cedar, Red fir, Hemlock, Lombardy poplar.

Trees with very large leaves.—Catalpa, Paulonia, Ailanthus, Great flowered magnolia, Cucumber tree, Kentucky coffee tree, Black walnut, Hercules club.

Trees with narrow or finely cut leaves.—Honey locust, Bald cypress, European larch, Willow oak, Black cherry, Sumach, cut-leaved varieties of many other species and most conifers.

Broad-leaved evergreens. — American holly, Great flowered magnolia, Swamp magnolia, Rhododendron, Mountain laurel.

Trees with fragrant flowers.—Swamp magnolia, Lindens (American and European), Black locust, Honey locust, Yellowwood, Wild crab apple, Wild plum, Cherries, Hawthorns, June berry.

Trees with showy white flowers (Blooming before the leaves).—Flowering dogwood, June berry, Plums, Cherries (blooming after the leaves); Catalpa, Horse chestnut, Buckeye, Magnolias, Basswood, Yellow-wood, Black locust, Hercules' club, Mountain ash, Rhodo-

dendron, Hawthorns, Sourwood, Silverbell tree, Fringe tree, Viburnum.

Trees with showy yellow flowers.—Tulip tree, Cucumber tree, Yellow-buckeye, chestnut, willows, sassafras, Witch Hazel, Birches (staminate).

Trees with showy pink flowers.—Red bud, Wild crab apple, Clammy locust, Mountain laurel, Rhododendron.

Trees with showy red flowers.—Red maple, Sumachs, Papaw.

Trees with showy red fruits.—Mountain ash, Flowering dogwood, Hollies, Red maple, Magnolias, Burning bush, Hawthorns, Cherries, Plums, Yew, Sumachs, Red Ailanthus.

Trees with bright Autumn foliage (Leaves turning red).—Sweet gum, Tupelo, Red maple, Flowering dogwood, Scarlet oak, Red oak, Sumachs, June berry, Hawthorn, Sorrell tree, Burning bush. (*Leaves turning yellow*) Tulip tree, Ginkgo, larch, Silver maple, White ash, Ailanthus, Cucumber tree, White birch, Hickories, Beech, Walnuts, Willows, Poplars. (*Leaves turning mixed red and yellow*) Sugar maple, Sweet gum, Sweet birch, Sassafras. (*Leaves turning purple*) White ash, White oak, Red oak, Dogwood.

Hardy coniferous species (Large trees).—White pine, Red pine, Pitch pine, Limber pine, Sugar pine, Table mountain pine, Austrian pine, Scotch pine. European larch, Norway spruce, White spruce, Red spruce, Colorado blue spruce, Engleman spruce, Douglas fir, Hemlock, Carolina hemlock, White fir, Giant arbor vitae, Bald cypress, Lauson cypress, Sitka cypress.

(*Medium sized and small trees.*)—Nut pine, fox-tail pine, Cembrian pine, Swiss mountain pine, Mugho pine, Korean pine, Lacebark pine, Dwarf umbrella pine, Black spruce, Dwarf juniper, Drooping juniper, Red cedar, Arbor vitae, White cedar (Chamaecyparis, Retinospora).

Trees that attract birds should be planted around houses. Thorny trees and shrubs are much sought by birds for resting places, because of the protection afforded from cats as well as other birds. Red cedar and other junipers are among the best. Others are English thorn, Hawthorn, Wild crab apple, European and American mountain ashes, smooth and staghorn sumach, Barberry, Buckthorn, Dogwood, Virburnum. The following planted near fruit trees and gardens will minimize depredations by birds; Red-berried elders, Buffalo berry, Bird cherry, Sweet cherry, Mulberry, Russian mulberry.

Street trees for Southern States.—Live oak, Water oak, Willow oak, Laurel oak, Great flowered magnolia, Pecan, Camphor tree, Palmetto, Desert Palm.

[In the February issue of AMERICAN FORESTRY Mr. Detwiler will have an article telling when and how to plant shade trees, to care for them and repair them. This will be of great value to any one wishing information and will appear in time to furnish instruction regarding spring-time planting—Editor.]

THE FORESTS OF BELGIUM

By CHARLES HARRIS WHITAKER

THE traveler, crossing from Dover to Ostend, or leaving the Channel to wend his way slowly up the Scheldt to Antwerp, or crossing from Harwich to the Hook of Holland, would scarcely picture the low-lying seacoast of Belgium and Holland as having once been girt with a thick forest. Yet this "nether land, hollow land"—whence we no doubt derive both of the words Netherlands and Holland—was at one time only saved from the further relentless encroachments of the sea by the tangled woods which grew about its seaward limits. They offered a barrier against which the sea beat in vain. The impenetrable network of roots and branches only aided in heaping up the dunes into those bulwarks which the skill of man was to transform later into dikes, and by their aid, turn the almost impenetrable morass into a land of fertility and abundance.

All of the territory which we once knew as the Netherlands, and which under the name of the Low Countries played so important a part in Europe's ceaseless wars of conquest and lust for power, was practically surrounded by forests. On the south, the hills and valleys of the Ardennes, densely wooded, offering an almost impenetrable obstacle to invasion, as they have today played so important a part in the war by barring the direct invasion of France by Germany. It is perhaps true that Belgium would have been spared many of the horrors which have fallen to her lot had the forest of the Ardennes not forced the German General Staff to make plans for the occupation of almost the whole of Belgium, although we must leave to the future the revelation to us of many secrets which are still unknown to the world at large. On the north was the sinister Badahuenna wood, whose only claim to historic value lies in the fact that it once resounded with the horrors of the Druidical sacrifices. On the eastern side there stretched away the great Hercynian forest. Legend has it that nine days were required to traverse the labyrinth of its wild ways from north to south, while its eastern extent was said to be so great that no German had ever been able to find its beginning, although one, most adventurous and courageous, had pluckily held to a journey of no less than sixty days.

Of these forests comparatively little remains. The Wood, just outside the Hague; the groves of Harlem, the forests of Soignes and Ardennes are all that have been left. From Amsterdam on the north to the banks of the Meuse, and from the seacoast to the Rhine, one seldom gets a view of anything which would even suggest that a forest had ever existed in this highly cultivated land. Trees are everywhere, for the Belgians knew well how to shade their roads and protect their streams. The long rows of willows and poplars, stretching away in every direction, are familiar sights, but there is no suggestion of the forest until one reaches Brussels or until one has journeyed south and west and come up with the border of the Ardennes. Just above Dinant on the Meuse, already a victim to the devastation which has overtaken this dauntless nation, the Ardennes begin, sweeping in a southerly and southeasterly direction clear down to the confines of the Duchy of Luxembourg and the frontiers of France.

The favorite holiday ground of thousands of Englishmen, the Ardennes are scarcely known to Americans. Within the boundaries of this delightful section there are to be found some of the finest woods in all Europe. Some of them seem to have come down from the days of Caesar, but best of all, one finds the keenest pleasure in knowing that, thanks to the compulsory replanting laws of Belgium, they are as nearly certain of preservation as it is possible to make them.

The Arduenna Silva was the most extensive forest within the Gallic do-

main and Caesar evidently believed it to extend from the Rhine to the North Sea, for he has so described it. It is the scene around which hang countless legends and stories and there seems no reason to believe that it was not in truth the very Forest of Arden of Shakespeare's play. It was to this forest that there came the rich noble from the court of King Pepin. So passionately fond was he of the chase that all else was neglected. On a certain Good Friday when he was following his favorite pastime, there came within his view a noble stag, bearing between its horns a golden crucifix. On urging his horse in the direction of the animal, he was astonished to note that it showed no disposition to flight, but stood calmly regarding him, although with an imploring eye. Strangest of all, it spake to the huntsman in these words: "Hubert! Hubert! For how long will this idle passion for the chase tempt thee to forgetfulness of thy Salvation?"

The conscience-stricken huntsman threw himself prostrate on the ground, crying, "Lord, what shall I do? I am ready."

And the voice answered, "Go to Maestricht to see my servant Lambert. From him shalt thou learn what to do."

The stag then disappeared as suddenly as he came. But Hubert went his way toward Maestricht and to Saint Lambert, there to make his confession in the monastery of Stavelot. Some years later he journeyed to Rome and after the martyrdom of Saint Lambert in the valley of Liege, the Pope appointed Hubert to be Bishop of Tongre. So goes the legend of St. Hubert and so goes many another, to the perpetuation of which the forest of Ardennes forever lends its deep recesses.

So far as is at present known, the Ardennes have not suffered materially in the present war. It is true that military necessity knows no law and even in spite of the long-established policies of forest cultivation and preservation by both Belgium and Germany, we may not assume that there would be the slightest hesitation in destroying any extent of forest in order to accomplish a tactical end. It is therefore not difficult to understand that within the area of operations which has extended from east of Liege to Antwerp, great quantities of trees have been sacrificed for strategic purposes. This is especially true of the woods about Liege and those lying between Louvain and Brussels and between Brussels and Malines. The Belgians have not hesitated to make these sacrifices in defense of their country and the Germans have cut down any woods which interfered with their operations.

VALLON DES PALISSADES.

A LITTLE VALLEY WHERE ONE MAY REST IN THAT QUIET WHICH ONLY THE FOREST GIVES.

ETANG DU ROUGE CLOITRE.

ONE OF THE DELIGHTFUL BITS OF WATER THAT DOT THE FOREST OF SOIGNES AND FORMING A PART OF THE GRAND ETANG DU ROUGE CLOITRE.

ETANG MONASTIQUE DE GROENENDAEL.

THE ANCIENT POND OF THE MONASTERY IN THE FOREST OF SOIGNES.

Letters which have been received within a very recent date indicate that so far the forest of Soignes has been spared. In view of the pangs which we have all suffered at the thought of the destruction of the ancient buildings in Belgium and France, always secondary to the thought of the agony which has been heaped upon the people themselves, it seems trivial to even think about a forest. Yet those who know the forest of Soignes would experience the profoundest sorrow were they forced to believe that it too had gone the way of all the rest.

Soignes is at once the pride and the glory of Brussels, one of the most beautiful of all the world's forests, one of the most delightful spots in all Europe. For reasons which it is quite easy to understand, its loveliness is little known to the thousands of Americans who annually visit Brussels. One goes to Belgium to see its art treasures—to study Van Eyck and Memling at Bruges and Ghent, to wander through the quaintness of Malines and Louvain—alas! that it has gone forever! In Brussels one may drive to the Bois de la Cambre, one of the most enchanting of parks, but few evidently have the courage or desire to continue the drive and lose themselves in the glades and archways of the forest of Soignes itself, which is practically a continuation of the park. It means a whole day, starting early and returning late, if one is to gain any real idea of the forest, but few who have made the journey will ever forget it.

BEECHES IN THE FOREST OF SOIGNES.
THE TRUNKS ARE CLOTHED IN AN ALMOST TRANSLUCENT VEIL OF DELICATE GREEN.

Some few months ago there came into my hands a very curious pamphlet with a title of such philosophic significance that in reading it one seemed to go back into the past of two or three centuries ago. It was entitled: "Study of an Element of the Restoration of Public Taste through a Return to the Contemplation of Forests and Natural Sites, particularly Forests and Methods of Conserving Them, and especially the Forest of Soignes."

Its naïveté takes one back to the fugitive broadsides and pamphlets of the time of Defoe, and yet it is in reality the title of a communication presented to the Fourth Congrés International d'Art Public, held at Brussels in 1910.

It was signed by René Stevens, the artist, and Louis Van der Swaelmen, Jr., an artist and landscape architect, and formed a part of the work undertaken by the League of the Friends of the Forest of Soignes; it puts forth a plea for revitalizing the beauties and glories of the forest, such as must have fallen upon sympathetic ears.

GRAND ETANG DU ROUGE CLOITRE.

THE LARGEST BODY OF WATER WITHIN THE FOREST OF SOIGNES.

SORTIE DU VALLON DE LA SOURDINE.

LEAVING THE FOREST OF SOIGNES BY ONE OF THE VALLEYS WHICH LEAD TO THE OPEN COUNTRY BEYOND.

The origin of "Soignes" seems lost in the misty distances of the past, but the forest dates back to the prehistoric era. At the beginning of history it opposed an impassable barrier to the invasion of the Franks, and established the linguistic frontier of the countries which, fifteen centuries later, were to unite under the name of Belgium. Up to the 15th Century this ocean of verdure beat against the very foot of the hill which now forms the center of Brussels, but by the end of the 18th Century, under the Austrian domination, it had been reduced to 12,000 hectares (29,652 acres).

Under the French and until 1822 it remained of this extent; but under the Dutch, and through its exploitation by the Société Générale Néerlandaise pour favoriser l'Industrie Nationale, which bought the forest from William of Holland, it became further reduced to nearly one-third that size. Today it covers only 4,860 hectares (12,000 acres), a striking example of how the Dutch Stock Company carried out its plan of favoring national industries, and an excellent illustration of the fact that great national resources were privately coveted and exploited long before the present era.

From among the noblest of its ranks were culled the planks of the flat-boats destined to serve Napoleon in his planned invasion of England; likewise, twenty-two thousand of its specimens were cut for building palisades about towns which were thought to be menaced by the allies.

Up to 1866 the forest fell victim to one interest after another, until finally the Administration became subject to such criticism that it appointed a commission, which, however, served only to partially arrest the destruction of the forest. During the ensuing years, up to the formation of the League of the Friends of the Forest, in 1909, its preservation was the constant subject of protest and agitation, and, as usual, this work centered about the personality of a man—René Stevens, painter, nature-lover, and an ardent champion of the inalienable right of the people to their national heritage.

AU VALLON DE BLANKENDELLE.

ON THE EDGE OF THE WOOD OF THE VALLEY OF BLANKENDELLE.

René Stevens was to the Forest of Soignes what Denecourt was to Fontainebleau, and the amazing chronicle of his efforts not only to preserve the forest but to render it known, accessible, and beloved is the crowning achievement of his life. To his aid came many others, and, with that tenacity of purpose which has won the Flemish race its proud position, the

DREVE DU COMTE.

ONE OF THE MOST MAGNIFICENT OF THE ROADS THROUGH THE FOREST OF SOIGNES, ITS ARCHED WAY OFFERING AN INDESCRIBABLE SPLENDOR OF LIGHT AND SHADE.

battle was carried to a point where the League now considers that it has attained the following results:

1. In relation to the preservation of the integrity of the forest:

a. That no concession of land of any kind, in the forest proper, shall be granted to any person soever.

b. That every concession solicited for land bordering upon the forest shall be rigorously examined and rejected whenever its granting would in any way impair or endanger the forest.

c. That, should the necessities of the bordering communities demand the construction of a tramway through the forest, it shall follow the line of the already established main routes, every other route being irrevocably closed.

d. That no new road, path or avenue, for any purpose soever, shall be opened in the forest.

e. That not even the tiniest parcel shall be diverted for the purpose of a so-called park, and that those spots which have been so treated shall be allowed to grow up in natural forest.

2. In relation to the forestry administration:

a. Cutting by *blanc-étoc has been completely abolished.

b. The coupes† jardinatoires, which have supplanted the coupes à blanc-étoc have been modified, so that the reserves shall be respected up to the point where their decay shall become manifest or a danger to the passer-by.

These conditions have diminished the revenue of the forest from five hundred thousand francs to two hundred thousand; but the League now desires to go further and, in addition to preserving the forest, to also accomplish the destruction of such features as have been introduced in order to give to it an "ornamental, exotic, or resinous" character, since these features are not only foreign to its physiognomy but are also contaminated with specimens which are destructive to the indigenous flora. In other words, the League believes that the Forest of Soignes shall and must be preserved as "a national reserve of natural beauty," and it is precisely in relation to the influence of such a reserve of beauty upon the lives, the welfare, and the development of a people that there was written the pamphlet with the quaint title.

DREVE DES ENFANTS NOYES.

ONE OF THE INNUMERABLE FOOTWAYS WHICH MAKE THE FOREST OF SOIGNES SO THOROUGHLY ACCESSIBLE.

Is it any wonder that artists such as Stevens and Swaelman made so passionate a plea for the preservation of the

* Literally "white-stump," and referring to complete deforestation of whole areas.

† After the manner of gardening; that is to say, the method of cutting out only the ripe and full-grown trees, and providing for a perpetual renewal.

On the Edge of an Opening where Beeches and Oaks Stand Guard, Forest of Soignes.

Vallon du Putois.

A WAGON ROAD THROUGH THE FOREST OF SOIGNES, THE NATURAL BEAUTY OF WHICH IS WORTH GOING FAR TO SEE.

VALLON DE LA VUYLBEEK.

A SUPERB COMPOSITION OF SUNLIGHT AND SHADOWS, ONE OF MANY SUCH BEAUTY SPOTS IN THE FOREST OF SOIGNES.

Forest of Soignes, and wrote so elaborate and exhaustive a treatise upon its influence upon the life of men? Every city should possess such a haven of refuge; there is no other setting of such nobility and restful beauty. It is the one great glorious creation without which all the art of the architect and the landscapist shall never attain perfection. It is one of the greatest sources from which men may draw the inspiration to make all our towns and cities not alone more beautiful, but more happy, dwelling places than we have been able to evolve up to the present time.

It was in recognition of these things, as well as of the fact that the selfish interests of timber exploiters would soon have left no tree standing in Soignes, that La Ligue des Amis de la Foret de Soignes was formed.

It was for just such a purpose that René Stevens undertook to make known to the people of Belgium the unsuspected beauties of a forest which is theirs by irrevocable right.

There are many ways of going to Soignes. You may climb the Montagne de la Cour, with its delightful evidences of the still-living Flemish spirit and manners, and journey by way of the tram which traverses the Avenue Louise, to the entrance to the Bois de la Cambre —one of the finest of all the parks of Europe. Through this you may walk direct to the forest, and thus approach, through an avenue which affords a fresh hint at every step, of the splendors which lie just beyond the park. Or, you may tram to Boitsfort, and enter the forest by either the Dreve de Welriekende or by the Dreve des Deux Montagnes. From Auderghem, also reached by tram, you may enter the forest by way of the majestic Chaussée de Wavre; or you may take tram at the Luxembourg Station, and either halt at the northern entrance to the forest or traverse it at one of its narrow points and alight at

Groenendal. By any of these routes, all of which provide easy and cheap access, the people of Brussels may reach their forest, and wander among such miles of roads and paths as are not to be found in many a day's journey—and seldom, if ever, beside the very gates of a great and important capital.

I remember learning from Professor Agassiz, one wintry voyage on the Atlantic when we were two of a ship's company of seven, how the beech attained its greatest splendor in the "beech-belt," which bisects the western section of the plain of Northern Europe; and as the solitary occupants of the smoking-room, with a wild gale raging outside, we held, that night, a symposium *a deux* upon the glory of the Forest of Soignes. Its beeches are unequaled, although they differ from our own variety in that the branches do not begin to leave the trunk so near the ground, thus affording longer vistas and greater heights.

One suffers in even thinking that the exigencies of war may demand that this forest, too, shall be sacrificed, for, like the architectural treasures which have already been reduced to ashes and broken fragments, the forest of Soignes is equally irreplaceable. It is the last remnant of the great forests of centuries agone, when man was slowly and painfully struggling upward, laying the foundations of that great Dutch republic, whence has descended that indomitable spirit which is today confronted with one of the saddest problems that ever befell a nation—the resurrection of Belgium.

SHADE TREES WORTH $17,000,000

THE State Forester of New Jersey has been trying to find out what the shade trees standing on the streets of municipalities may be worth. The suggestion that a census of shade trees be taken was made to each of the fifty-odd shade tree commissions in the state upon the following basis.

1. That every tree which appeared to have at least ten years more life be tallied.
2. That every tree that was badly injured or entirely out of place be ignored.
3. That species be not considered.
4. That size and general condition be the sole factors.
5. That all trees be grouped and values assigned according to the following table.

Diameter Breast High.	Good *Values*	Fair
Less than 2″	$ 3	$ 2
2″ to 4″	5	3
4″ to 6″	10	6
6″ to 9″	20	10
9″ to 12″	40	20
12″ to 16″	80	30
16″ and over	100	40

It is admitted that this scale is arbitrary, and the values assigned, especially for the larger trees, are low, but it is at least conservative and assumes a limit to the value of fully developed trees. Though returns have been received from only seven communities the result is startling.

Bound Brook finds that it has $83,855 worth; East Orange has $810,000 worth; Glen Ridge has $122,263 worth; Hackensack has $259,863 worth; Irvington has $184,104 worth; Newark has $1,685,005 worth; Rutherford has $80,000 worth.

If these figures are reduced to a per capita basis and applied to the whole State on the basis of the 1910 census it appears that New Jersey has upwards of $17,000,000 worth of shade trees. Though the figure is almost too great for belief there is no doubt that it represents much less rather than any more than the actual value of the shade trees as they now stand. They could not be reproduced for twice the sum. This inquiry suggests that every city, town and borough in the State would probably find it profitable to inquire what may be the value of its shade trees, and to make some provision for the preservation of those that it now has even if nothing is done toward getting more where there is place for them.

THE DRYAD'S MESSAGE

He who wantonly kills a tree,
All in a night of God-sent dream,
He shall travel a desert waste
Of pitiless glare, and never a stream,
Nor a blade of grass, nor an inch of shade—
All in a wilderness he has made,
Oh, forlorn without trees!

He who tenderly saves a tree,
All in a night of God-sent dream,
He shall list to a hermit-thrush
Deep in the forest, by mountain stream,
With friendly branches that lean and shade,
All in a woodland that he has made.
Oh, the peace of the trees!

He who passionately loves a tree,
Growth and power shall understand;
Everywhere he shall find a friend.
Listen! The, greet him from every land,
English Oak and the Ash and Thorn,
Silvery Olive, and Cypress tall,
Spreading Willow, and gnarled old Pine,
Flowering branches by orchard wall—
Sunshine, shadow and sweetness of glade—
All in a Paradise he has made.
Oh, the joy of the trees!

LOUISE MOREY BOWMAN.

THE STORY OF WHITE PINE

By Hu Maxwell

WHITE pine's individuality is, like Napoleon's, "grand, original, and peculiar." The wood is seldom mistaken for any other, and the tree never. It is a conspicuous feature of any landscape where it occurs. No person who has once made its acquaintance will ever afterwards fail to recognize it at sight, no matter how far away, provided the characteristic arrangement of the branches can be made out. The limbs are set on the trunk in regular whorls when the tree is young; and, though as age comes on, many branches die and the wheel-like form of the whorls is broken, yet the general arrangement continues through life. Many other trees show the same arrangment in youth, but few hold to it during life as tenaceously as does the white pine. It owes its botanical name to that habit. *Pinus strobus* means "whorled pine." The order is wholly different from the tufted tops of the southern yellow pines; the similar crowns of the Norway pine, or the irregular branching of the western yellow pine, or the slender and scattered limbs of the jack pine which is the white pine's associate in much of its westward range. It is natural that the white pine's tree form should impress those who see it for the first time as well as those whose acquaintance with it has been long and intimate. In the well-known peom by Mrs. Hemans, "The Landing of the Pilgrims," the strongest feature in the picture is caught in the first stanza:

"The breaking waves dashed high
On a stern and rock-bound coast,
And the woods against a stormy sky
Their giant branches tost."

It is the picture of the lofty white pines on the Massachusetts hills, their huge and clear-cut limbs thrashed by the December winds.

Log Boom in St. Louis River.

TWENTY-FIVE THOUSAND PINE LOGS IN ONE BUNCH READY FOR THE SAW. BORING BEETLES DO NOT ATTACK AND FUNGUS DOES NOT DISCOLOR PINE IN THE CLEAR WATERS IN MINNESOTA. THE PICTURE REPRESENTS A CORNER OF THE COLQUET LUMBER COMPANY'S PROPERTY.

The white pine was not discovered at Plymouth in 1620, but there and then occurrred its formal introduction to the white man on the American continent. The best of a splendid race of men and the finest representatives of the forests there met, and each in its own domain was the "heir of all the ages in the foremost files of time."

EARLY UTILIZATION.

Contrast the New England pine with the vast forests of mahogany on the west coast of Africa. The latter were discovered first. Yet they remained untouched for nearly four hundred years, while white pine was put to use immediately; and so long has that use continued, and in territory so extensive, that it is no exaggeration to claim for white pine that it has been the most important building wood in the history of the world. That holds in amount and also in variety of uses. Its softness and weakness have barred it from some places in modern manufacturing, and its lack of figure has disqualified it for others; but its range of usefulness has been so wide, and the supply so great, that it held first place in forest materials during two and a half centuries; and, though it has now dropped back from the first rank, it still occupies a position of great importance, and it will continue to do so for all time. As a timber tree, it is not doomed to extermination as some have been led to suppose. It will have, and it is already having, a new life. Most of the old conditions have passed, but new conditions are developing. That ought to be apparent from the fact that Massachusetts, where the first white pines were cut, still supplies considerably more than one hundred million feet of this timber yearly, and as far as the future may be judged, Massachusetts will go on, furnishing that much yearly, for a thousand years. What one region does, others can do.

A word concerning its early uses is in order, because its first utilization was prophetic. Lacking six years of three centuries ago, the first homes of white men, within the white pine's range in the United States, were built. The forests immediately responded to the demand for building material. It is a

"On the Firing Line."

WHITE PINE'S EXTREME FRONTIER IN THE UNITED STATES, NEAR RAINY LAKE BETWEEN MINNESOTA AND CANADA. AXEMEN WILL SOON CHANGE, THIS SCENE. NOTE THE FINELY WHORLED BRANCHES OF THE TREE IN THE BACKGROUND. SUCH IS THE TYPICAL WHITE PINE CROWN.

SQUARES FOR WINDOW SHADE ROLLERS.

MORE THAN 60,000,000 FEET OF WHITE PINE ARE ANNUALLY MADE INTO SHADE AND MAP ROLLERS IN THE UNITED STATES. THIS WOOD IS UNSURPASSED FOR THAT PURPOSE, BECAUSE OF ITS LIGHTNESS AND ITS DISINCLINATION TO WARP. HIGH GRADES ONLY ARE USED.

remarkable fact that some of the articles made of white pine within a few years after the landing of the Pilgrims are in existence yet. A door of this wood, which was swinging on its hinges within eleven years after the first foot touched Plymouth Rock, is a venerable relic today. It was one of the attractions at the Forest Products Exposition in Chicago and New York this year. It came from Medford, Mass. It cannot be claimed that it was the first door made by white men in the United States, but it is the oldest in existence.

The door is of soft, clear New England white pine. Age has somewhat browned it, but, to all appearances, the wood is as sound as it was on the day when the Puritan carpenter finished his job and swung the portal for the first time—1631. The event might be passed over as a mere incident but for the fact that it was the beginning of what has become an enormous industry. The first use of white pine in America was in door making. If the wood's selection at that time was accidental, it was a fortunate accident. The use has continued till the present, not only for doors but for practically every kind of interior and exterior house finish. It is not improbable that this pine has made twice as many doors as any other wood of the United States, and to say this is no disparagement of the many other excellent woods which have been and are being used for doors, by millions of feet annually. But white pine was first in time, and for two hundred and fifty years it maintained its place as first in quantity. It may still be first, though the figures to prove the statement that it now leads all other woods in doormaking cannot be authoritatively quoted. Frames, sash, blinds, and other similar articles are listed together in statistics, and in the totals white pine is exceeded by the combined manufactures of the southern yellow pine, but by no other wood or group of woods; but in doors alone white pine may still occupy the first place in quantity as it unquestionably does in quality.

WHY ITS HIGH PLACE.

There is reason for the prominent position as building material occupied by white pine. It has given good service practically everywhere. It was the sleeper and the shingle, the founda-

tion and covering of houses. It is equally suitable for matches and shipmasts. The plank and picket fences which enclosed farms and gardens were of this pine before advancing price displaced them, but the wood yet fills much demand in that direction. It is the most important box and crate wood in the United States, and has always been. No other possesses so many of the desirable qualities demanded by the box industry. Fields of its usefulness might be further specified almost indefinitely.

Back of the great demand stand the two prime reasons, suitability and abundance. Neither could alone lead to so nearly ubiquitous demand. When white pine is oven-dry it weighs twenty-four pounds per cubic foot, which is equivalent to 2000 pounds per 1000 feet board measure. But wood for business purposes is never oven-dry, and an extreme lightness of two pounds per board foot is theoretical only. About 2400 pounds per 1000 feet is the weight of the lightest pine handled by the ordinary yard. Sugar pine of California is a little lighter than white pine, but all others of America areheavier. Southern longleaf yellow pine is nearly twice as heavy. Though white pine which has been subjected to a long period of air-seasoning seems absolutely dry, it really contains several hundred pounds of water to a wagon load of the lumber. It is impossible in practice to have wood absolutely dry, but white pine can be made as nearly so as any. When it has been thoroughly seasoned, there is such a small amount of moisture in it that the wood warps next to none as a result of atmospheric changes.

That is why it is so well liked for doors, frames, sash, machinery parts, and cores for veneer work. Once in place, it is always in place. It is dependable. It holds its shape. Few woods are its equal in that respect. The New England door already mentioned though it is 283 years old, is as true today as when it clicked its wooden lock for the first time. The joints are as tight as are those of Egyptian coffins.

In the museums and historical houses of northeastern states are innumerable relics of former times, such as cornice,

IN THE FRONT THREE HUNDRED YEARS.

WHITE PINE PICKETS HAVE PALED IN MORE YARDS AND GARDENS THAN ANY OTHER WOOD ON EARTH. THE EARLIEST NEW ENGLANDERS USED THEM AND THE VILLAGE YARDS IN THE LAKE STATES STILL SELL THEM BY THOUSANDS. THE PICTURE SHOWS A TRUCK LOAD IN THE PINE TREE MANUFACTURING COMPANY'S YARD AT LITTLE FALLS, MINN.

A VIRGIN FOREST OF WHITE PINE.
SUCH A FOREST IS RARE NOWADAYS, WHEREAS ONCE THEY WERE IN GREAT PROFUSION.

flooring, frames, structural timbers, chests, weather-boarding, furniture, brackets, and many more, and the white pine of which they are chiefly or wholly made has remained unwarped, unchecked, and generally without decay, since before the Revolutionary War.

The wood is rated weak and brittle in comparison with longleaf pine of the southern states or Douglas fir of the Pacific Coast. It is not now considered suitable for structural timbers intended for heavy loads; but enormous quantities of it have been used, more in early times than now. It was once so plentiful that the builder cut his structural timbers large enough to carry the load, or he put in more timbers until the required strength was secured. It was rafters and wall plates, braces and studding, joists and kingposts. White pine is too costly to be so used now; and it is not demanded, because stronger woods are available, and this one's best service is given elsewhere.

White pine is one of the plainest woods. It has no figure except that produced by the annular growth rings, and it is characterless and uninteresting. Being a coniferous wood it, of course, has no pores, and consequently the application of stains and fillers produces only flat and monotonous effects. By chewing a splinter, a decided taste of turpentine may be had, and the odor is marked; yet, it is usual to class white pine with the tasteless and odorless woods. These terms belong to the box maker, and that is his way of stating whether a certain wood will injure articles shipped in boxes, particularly food. Most woods of white color are satisfactory in that respect, and white pine is one of the best. Vast quantities have been made into shipping boxes. Millions of pairs of New England shoes have gone to market in those containers, and millions of yards of cloth. Further west the white pine boxes have carried groceries and other household articles. The annual white pine supply to box factories in Michigan is 57,000,000 feet; in Illinois 105,000,000; in New York 133,000,000; in New Hampshire 142,000,000; and in Massachusetts 263,000,000. It is the leading box material in all of these states. It likewise leads for the whole United States. The total exceeds 1,100,000,000 feet yearly. The nearest approach to that vast figure is by the southern yellow pines, while red gum stands third with a little more

Photo by Clyde Iron Works, Duluth, Minn.

WHITE PINE STUMPS TWENTY YEARS AFTER.

WHEN THESE TREES WERE CUT THEY ALL WENT TO MARKET AS WHITE PINE. AN EXAMINATION OF THE STUMPS REVEALS THE FACT THAT ONE IN FIVE OR SIX IS NORWAY PINE. THE LATTER ARE VALUABLE FOR DISTILLATION. THEY DO NOT DISAPPEAR BY DECAY IN LESS THAN FORTY YEARS, BUT WHITE PINE STUMPS DISAPPEAR MORE QUICKLY. LAND LIKE THAT SHOWN IN THE PICTURE IS BEING CLEARED FOR AGRICULTURE IN MICHIGAN.

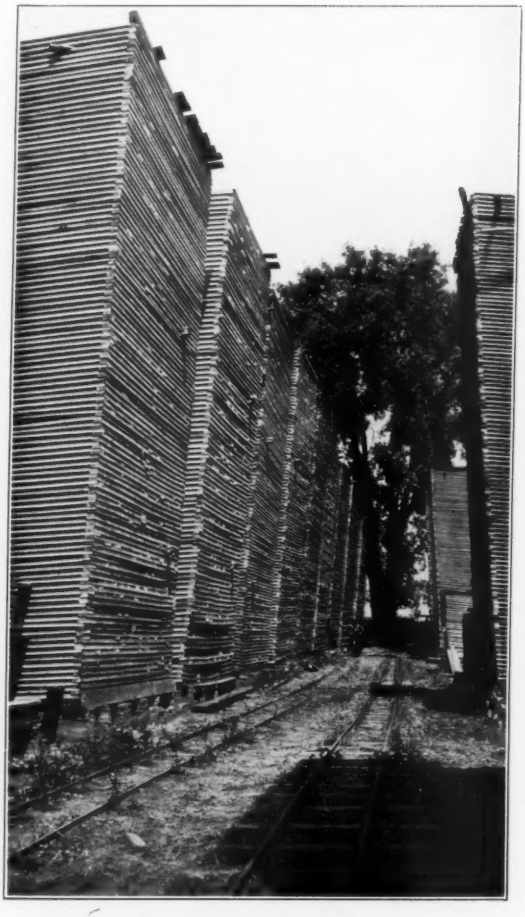
than one-third as much box lumber as white pine supplies, and spruce ranks fourth.

RANGE AND NAMES.

Trees which occur over extensive geographical regions are usually burdened with names. Loblolly pine, for example, which does not cover half as much area as white pine, has twenty-three well-recognized names. White pine bears one name everywhere for the living tree, but sometimes when the quality of the wood is referred to, the terms cork, soft, and pumpkin pine are used. White oak is another noted example of a tree with wide geographical range and with but one name. In the case of both the oak and the pine the "white" in the name refers principally to the color of the wood.

The terms cork pine and pumpkin pine were formerly heard, but less frequently now, except as matters of history. They had reference to qualities of the wood. Pumpkin pine was the usual term in New England, but cork pine was preferred in western New York and in the Lake States. Both meant the same. The wood was described "as light as cork and cuts like a pumpkin." Such stock came from large, mature trees which grew in good soil and grew rapidly. The annual ring was principally springwood, therefore soft, white, and light. New England ship builders mounted a wooden ball, a foot or less in diameter, on the ship's flagstaff, for ornament. The ball was sometimes called a pumpkin, because of its shape; and since it was cut from the softest and best white pine, it was natural that the desired grade should be called pumpkin pine. The origin of the name has been ascribed by others to the fact that such pine has little of the flinty wood—which is due to the part of the rings known as summer growth—and cuts in all directions like a pumpkin. No better reason can be given for the term cork pine than that the wood is light.

Soft pine naturally applies in the same way, but it is a more general term.



STACKS OF WHITE PINE FOR EXPORT.

HERE IS SHOWN SOME OF MINNESOTA'S BEST PRODUCT. THIS GRADE IS OFTEN CALLED "CORK" PINE AND CORRESPONDS TO THE "PUMPKIN" PINE ONCE ABUNDANT IN NEW ENGLAND. IT DRIES AS STRAIGHT AS AN ARROW. PATTERN MAKERS WANT THIS KIND.

There are thirty-seven species of pine in the United States, and twelve of them are classed soft pine. The division between hard and soft is somewhat arbitrary, if the terms are meant to

refer to the actual hardness and softness of the woods. A rapidly-growing tree in good soil may produce soft wood, while a tree of the same species in poor, dry soil will likely yield wood much harder. The difference is due principally to the rate of growth, but not wholly so. Shortleaf pine (*Pinus echinata*) is usually and properly classed with the hard pines; yet, owing doubtless to a favorable combination of soil and climate, an area in southern Arkansas and northern Louisiana produces this pine of so soft a grade that it is actually said to sell sometimes as white pine. Another example, though it is on a small scale, will serve to emphasize further the influence of soil and situation on the texture of wood. The table mountain pine (*Pinus pungens*) usually produces wood fairly soft. Yet, on the precipitous crest of a bleak and lofty spur of the Alleghany Mountains in West Virginia there is a clump of these pines so stunted and of such slow growth that the wood will turn the edge of a pocket knife as lignum-vitae might do it, and its texture resembles that of horn. Instances of this kind are valuable for the light they throw on the soils' influence on the texture of growing wood.

The habitat of white pine extends east and west 1,800 miles, from Newfoundland to Manitoba. Approximately half of its range lies in Canada and half in the United States. Toward the northern border of its range the soil is thin and the climate cold, consequently the average size of the trees is small. The limit of the species in that direction is set by climatic conditions, but such is not the case toward the southern limits.

There the white pine came in contact with many kinds of hardwoods on good soil and was unable to make headway against them. In the western part of its range this pine grew southward to the lower end of Lake Michigan and took possession of some of the sandy tracts in northern Indiana, where its progress ended; but in the East it followed the Appalachian mountians southward to Georgia. The tree's extreme range east and west extends 1,800 miles, and 1,200 north and south.

No man knows what quantity of white pine was on the stump at the

NEARLY OUT OF BUSINESS.

THE REFUSE BURNERS AT THE BIG WHITE PINE MILLS NO LONGER CONSUME MUCH MATERIAL. SLABS ARE WORKED INTO LATH, MOLDING AND OTHER SMALL ARTICLES, THE SAWDUST GOES TO STABLES AS HORSE BEDDING, THE CHIPS AND SPLINTERS ARE LOADED IN CARS TO BE HAULED TO THE TOWNS FOR FUEL, AND VERY LITTLE FINDS ITS WAY TO THE WASTE HEAP. THE PICTURE REPRESENTS A SCENE AT THE MILL OF THE NORTHERN LUMBER COMPANY AT COLQUET, MINN.

Photo by "Pine Cone," Minneapolis, Minn.

SPRINGTIME ON A MINNESOTA RIVER.

LOGS OF THE WINTER'S CUT ARE WAITING FOR THE FLOODS TO CARRY THEM INTO THE BOOM SOME SCORES OF MILES DOWN STREAM. THESE SMOOTH PINE LOGS WILL LOSE MUCH OF THEIR BARK DURING THE JAMS AND THE BUMPS OF THE DRIVE, BUT THE WOOD WILL NOT BE INJURED AND SUCH IS THE MATERIAL OF WHICH HIGH GRADE LUMBER IS MADE. ON THE RISING GROUND BACK OF THE RIVER SHORE, THE VIEW SHOWS A FINE FOREST OF WHITE PINE, APPARENTLY WITHOUT A TREE AMISS. THEIR TURN WILL COME NEXT WINTER.

coming of civilized man to these shores, but estimates have been made. It is assumed that the superficial extent of the range then was approximately the same as now. Three hundred years have not much extended or contracted the boundaries, notwithstanding the enormous lessening of the stumpage. The area actually occupied by the original forests has been estimated at 225,000,000 acres, and the stumpage at 450,000,000,000 feet. The estimated stumpage seems conservative in view of the fact that nearly half that much has been marketed from the Lake States. The total stand, in the foregoing estimate, included that in Canada as well as in the United States. The remaining stumpage south of the international boundary line is now placed at approximately 25,000,000,000 feet, of which Michigan has 2,000,000,000, Wisconsin 3,200,000,000, Minnesota 12,500,000,000, and the remainder is in New England, New York, and southward along the Appalachian ranges. The reported sawmill output of this wood in 1912 was 2,700,000,000 feet, the leading states in the production following:

	Feet
Minnesota	1,225,674,000
Wisconsin	397,549,000
Maine	280,145,000
New Hampshire	240,215,000
Massachusetts	143,119,000
Michigan	141,003,000
New York	76,355,000
Pennsylvania	71,870,000

Twenty-five states have white pine sawmills, the smallest number being one in Indiana.

The size of mature white pine trees varies with the region. The average is now much smaller than before the best was cut. Probably a diameter of two feet and a height of 100 will be found reasonable at this time. The pines of the Lake states were smaller than those in the original forests of Massachusetts, if reliance can be placed on the fragmentary accounts which have come down to the present. There are apparently authentic records of white pines

Photo by "Pine Cone," Minneapolis, Minn.

LOGGING CAMP IN A NORTHERN PINERY.

A TYPICAL TEMPORARY HABITATION OF THE MEN WHO FELL THE PINES AND BRING THE LOGS OUT OF THE WOODS. THE DOUBLE WALLS OFFER GOOD PROTECTION AGAINST THE WINTER COLD, FOR THE THERMOMETER HERE STAYS BELOW ZERO DURING MUCH OF THE LOGGING SEASON. THE THINNED FOREST IN THE BACKGROUND SHOWS THAT THE CUTTERS HAVE FINISHED NEARBY, AND A FEW STRAGGLING PINES AND A BRICK OR TWO ARE THE REMNANT OF THE FORMER STAND.

240 feet high and six or seven feet in trunk diameter in the primeval forests of New England, and one extreme instance is cited of a tree 270 feet high which stood on the site of Dartmouth College. It is uncertain whether these were guesses or measurements. In view of the astounding discrepancies between the guesses and measurements of some of the big trees of California and Australia, it would be interesting to know the exact origin of some of the figures for New England's famous pines. There is no question, however, that of all the pines of the United States, the sugar pine alone exceeds the white pine in size.

WHITE PINE LUMBERING.

Two and a half centuries have seen many changes in lumber operations. Practically all that is known about logging, and absolutely everything known about sawmilling have been learned in that period. The cutting of timber was on a mighty small scale before that time. Julius Caesar made more ado over getting out enough dimension stock for his bridge across the Rhine than a contractor these days would over a contract to supply the Panama Canal. One of Solomon's great glories consisted in bringing up to Jerusalem timber for the Temple, and he had an army at work on the job during several years, yet the whole bill of lumber was less than a first-class Minnesota white pine sawmill cuts in one forenoon.

The world had no real lumbering experience until it was learned in America, and the beginning was made with white pine in Massachusetts, New Hampshire, and Maine. It continued with white pine in New York and Pennsylvania, and ended with white pine in the Lake States. As men learned more the methods changed. Ox teams dragged the logs out of the woods along the Piscataqua river, and the old sash saws wasted half in getting out the stuff. By the time the lumberman reached the vast pineries of New York and Pennsylvania the discovery had been made that wood will float, and the rivers and

lakes were utilized to carry the pine logs from forest to mill. Before the golden age of New York's white pine period had passed, the steam saw mill put in its appearance, and the chugging sash saw and the flutter wheel vanished.

By that time the railroad was carrying lumber to such markets as no boat or ship could reach, and the land market for white pine assumed proportions never heard of before. Then came Michigan, Wisconsin and Minnesota with their matchless forests of pine, and Chicago as the distributing market for the product. That was two hundred years after the first lumbering was done on the Atlantic seaboard. Michaux in his day said that the white pine lumberman moved westward twenty-five or thirty years ahead of the farmer, and De Tocqueville said that the farmer's rate of movement westward was seventeen miles a year. Both of the writers set too rapid a pace. The average movement of the lumberman from New England to the Lake States for two hundred years was five miles a year, and the white pine lumberman led the van. They have reached Minnesota where the forests of pine end.

MARKETS AND PRICES.

It seems superfluous to designate the white pine markets. The wood not only goes everywhere now, but it has been going since the first. Within thirty years after the Pilgrims landed in New England they were sending white pine lumber to Africa and trading it for slaves. They traded the slaves in the West Indies for rum which they sold in England and Holland, and brought cash home. That was 250 years ago. This present year Minnesota lumbermen are exporting white pine to Africa where the earliest exports of this remarkable wood went; but it is needless to say that slaves are not accepted in payment, nor is it necessary to haul rum thousands of miles to complete the trade; because payment now comes back in yellow gold from the Rand and diamonds from Kimberley.

It is natural that prices vary greatly, not only now, but in past years and centuries. Formerly the place of sale had most to do with the price; now it is the grade. When pine was plentiful everywhere, only the best was offered for sale; and, except for the matter of freight, it brought about the same figure everywhere. In 1805 rafts of choice pine from western New York sold in Pittsburgh for five dollars a thousand; but similar lumber, rafted 2,000 miles further to New Orleans, brought $40. In early days in Michigan good pine was sometimes bought at four dollars a thousand at the mill.

Prices are more systemized now. The following list gives the average mill run values, of white pine lumber in the yard, for the whole United States:

	Per 1000 feet
1899	$12.69
1904	14.93
1906	18.32
1907	19.41
1908	18.17
1909	18.16
1910	18.93
1911	18.54
1912	19.13

The wholesale prices of white pine by grades in the Lake States in 1912 were as follows: Selects C and better 5/4 (M. L.), Minnesota, $54.51, Wisconsin, $57.06.

Inch finish, C Selects, 10″ (M. L.), $46.48, Wisconsin, $48.04, Michigan, $47.33.

Shop No. 1, 8/4 (M. L.), Minnesota, $47.65, Wisconsin, $48.84, Michigan, $53.38.

Shop No. 3, 5/8 (M. L.), Minnesota, $23.23, Wisconsin, $24.02, Michigan, $27.42.

Beveled Siding, C 6″-16′, Minnesota, $23.94, Wisconsin, $24.96, Michigan, $26.33.

Boards No. 2, 1″ x 8″-16′, Minnesota, $22.43, Wisconsin, $23.56, Michigan, $26.38.

Boards No. 3, 12″, 10′-20′, Minnesota, $20.53, Wisconsin, $21.09, Michigan, $25.67.

Boards No. 4, Mixed Widths, 10′-20′, Minnesota, $14.32, Wisconsin, $14.-65, Michigan, $13.50.

Fencing, No. 2, SIS, 6″-16′, Minnesota, $25.02, Wisconsin, $25.53, Michigan, $28.50.

Lath, No. 1 (W. P.), Minnesota, $3.63, Wisconsin, $3.71, Michigan, $3.92.

Lath, No. 1 (Mixed), Minnesota, $3.27, Wisconsin, $3.40, Michigan, $3.45.

Mill run, Vermont, $18.72, Maine, $18.19, Minnesota, $18.91, Wisconsin, $20.34, Michigan, $22.67, Pennsylvania, $21.33, New York, $21.07, New Hampshire, $17.61.

Nearly all wood-using industries find a place for white pines. Lists show that in New York 44 articles are made partly or wholly of it, 48 in Massachusetts, 66 in Michigan, and 116 in Illinois.

THE FUTURE SUPPLY OF WHITE PINE.

The boundaries of this tree have not contracted much in historic time, though the total stumpage has declined to one-tenth of what it formerly was. Wherever the trees once grew, some still grow, except that tracts of small size in some instances may have been entirely denuded by cutting and fire. If no seed trees are left, and all seedlings are killed by fire, white pine in that area is ended until seeds blow in from the outside or seedlings are planted by man. Complete extermination over large tracts seldom occurs, and the remaining trees here and there begin the slow process of restocking the vacant places. Fire is more destructive than the ax. Small white pine die from a slight scorching. Some one has figured out, after extensive observation, that pitch pine (*Pinus rigida*), which is often associated with white pines, will survive sixty-fold as much fire. That may be putting it strong, but no fact is better known than that white pine seedlings are so easily killed that a passing fire seldom leaves one alive. To that susceptibility to injury is due the barrenness of parts of Michigan and other Lake States where splendid pine forests once grew. It is there more than in other parts of white pine's range that total extirpation of the species has occurred over considerable

RESIDENCE FINISHED IN WHITE PINE.

THIS IS A MINNESOTA HOME AND IT DISPLAYS ONE OF THE BEST USES OF THE WOOD. IT HAS BEEN PUT TO SIMILAR SERVICE DURING ALMOST 300 YEARS AND HAS LOST NONE OF ITS POPULARITY. THIS IS THE HOME OF J. E. LYNCH, COLQUET, MICH.

areas. The well-organized efforts to keep forest fires in subjection are improving the conditions and giving the pine a chance to come back. The few remaining seed trees bear abundantly, and the winged seeds are carried long distances by the wind and are restocking many a vacant place.

In parts of New England, particularly in Massachusetts, fine stands of young white pine have taken the place of forests cut long ago. Practically every foot of this wood now passing through Massachusetts sawmills is second growth; that is, it has come on since the old stands were cut. The trees stand close together and are straight, yet, because they are still young, they are limby and the resulting lumber is knotty. However, growth is rapid. White pines of suitable size for good saw logs are now growing on the graves of the unfortunate British soldiers killed at Concord; yet the trees were not planted until fifty years after the battle. This shows the rate of growth. New York is now doing a great work at reforesting with white pine, and Pennsylvania may be expected to do as well. The sawmill output of this pine may be expected to decline still further, but it will then have reached its lowest point, and will begin to move up, with the assurance that the country will always have white pine lumber.

TREE PLANTING IN NEWARK

By CARL BANNWART
Secretary Newark Shade Tree Commission

TREE planting is as old as the hills. But a new way of handling this old practice has come to pass with us in Newark. Tree planting has become here a municipal function; and this new method, both in itself and in its results, is highly interesting.

If, ten years ago, we had announced that we would undertake to set out 1,500 trees along ten miles of frontage and assess the cost thereof on the properties benefited, the property owners would have been not only surprised but astonished. At the present time, however, such an undertaking does not create a ripple of interest; yet just such planting is what we propose for this present Fall season. And the fact that it creates no interest is in itself interesting, as indicating how public sentiment has fallen in with this scheme of municipal planting and has come to accept it as a matter of course.

For the past six weeks we have been subsoiling for these proposed new trees. This subsoiling amounts to something like three tons for each tree, sixty cubic feet, approximately 4 x 4 x 3½ feet. Now we are planting: first, new plantings, second, replacing failures of our own recent plantings. Of new plantings about 1,500 trees will be set out in this way: 1,000 2″ Norway Maples and 500 2″ Oriental Planes (Variety Acerifolia). These trees are all provided with tree guards and stakes. The average cost is about $4.00 per tree. This is the only direct charge the property owner is to bear. The trees are cultivated, pruned and sprayed. Failures, broken tree guards and stakes, are replaced without additional direct charge to the property. The guaranty is unlimited, whether a runaway or other maltreatment or whatsoever cause is responsible for the death of the tree.

We could perhaps set out more trees if it were not for the necessity of taking care of these in perpetuity after planting. Therefore we do not increase our plantings at a greater ratio than the appropriation to the Department for maintenance permits.

THE FIRE PROTECTION ON THE NATIONAL FORESTS IN 1914

By HENRY S. GRAVES

THE season of 1914 has been one of very grave emergency in preventing destructive forest fires in the National Forests. The hazard in the heavily timbered portion of the Rocky Mountain and Pacific slope regions has been in many ways the greatest since the establishment of the National Forests. The conditions of drought and other factors of forest fire hazard were fully equal in severity to those of 1910, the year of the disastrous Idaho fire, and in many sections the danger was even worse than during that year.

During the season more than 6,000 fires threatened the National Forests, or 1,000 fires more than occurred in 1910. To put out these fires and to prevent others from starting the Forest Service has been put to the severest test in its history. That it met this test successfully is indicated by the fact that the damage to timber this year is less than 4% of the damage done in 1910.

The past season has definitely demonstrated that while we cannot expect entirely to prevent forest fires from starting, their damage can be kept down to a small amount provided there is an efficient organization and adequate funds to meet every emergency swiftly and effectively.

SEASONAL CONDITIONS

The factors which create a season of large forest fire risk are variable and often complex. Primarily, the risk depends on the frequency of soaking rains. If there are good rains, well distributed through the season, the danger from fire is small. The hazard depends also to a certain extent on the total aggregate of rainfall during the season. The total precipitation, however, does not always indicate conditions of drought, for a few very heavy storms separated by long intervals of drought would be a less favorable season for fire protection than a smaller aggregate amount of rain falling at more frequent intervals. A further factor is the depth of the winter snow, for with a light snowfall the ground is exposed early in the spring. An early spring, especially when accompanied by rains, means a vigorous herbaceous vegetation which matures and dries up early; it then becomes inflammable and a source of danger. Still another factor of importance is the behavior of the wind. In certain places on the Pacific coast, the easterly winds are the dry and dangerous winds. A dry wind lasting for only a day or two dries out the forest with great rapidity and an emergency immediately results. Still again, the condition of the nights may influence the hazard. In some sections the principal fire fighting has to be done at night. If it cools off and the wind dies down, it is much easier to get control of the fires than where the nights are hot and windy.

During the winter of 1914 there was a relatively small fall of snow. There was, therefore, an early spring throughout the northwestern and Pacific coast regions. In certain parts of California, as, for example, in Modoc County, the vegetation started growing five weeks earlier than in the normal season. In some sections fires began to occur in May, although the conditions did not become serious until early July. In north central Idaho no rain fell from July 4 until September 7, a dry spell 17 days longer than in 1910. In the north Pacific Coast region there was a continuous drought for over 70 days, which is the longest in history. During this period of excessive drought there were unusually high temperatures, high drying winds, and in many sections exceptionally dry nights. It was the

hot nights and the periods of hot winds that made the season unusually difficult in California.

The abnormally early season is illustrated by one rather unusual fire. This occurred on the west slope of the Olympic Peninsula where, on May 6, a spark from a fire, set by a road crew to burn some débris on the right of way for a road, caught in the moss in the high tree crowns. Almost instantly the fire spread from crown to crown, killing the trees, although the conditions on the ground were such that a fire could not run at all. In this particular fire it was necessary to fell many trees, some of them from 6 to 10 feet in diameter, before the fire could be stopped.

DISTRIBUTION OF FIRES

The bulk of the fires occurred in western Montana, northern and central Idaho, Washington, Oregon, and California. The seasonal conditions elsewhere in the National Forests were normal and but little difficulty was encountered. The following table shows the distribution of the fires:

District	*No. of Fires*
No. 1 (Montana, northern Idaho, North Dakota)	1,975
No. 2 (Colorado, eastern Wyoming, South Dakota, Nebraska, Minnesota, Michigan)	279
No. 3 (Arizona, New Mexico)	509
No. 4 (Utah, Nevada, southern Idaho, western Wyoming)	327
No. 5 (California)	1,468
No. 6 (Oregon, Washington)	1,239
No. 7 (Arkansas, Florida, White Mts., Appalachians)	315
Total	6,112

CAUSES OF FIRES

At the time of writing this article the reports were not sufficiently complete to give an accurate classification of the fires according to their causes. A preliminary survey of them shows that the classification will not differ very materially from that of previous years. The greatest departure from the normal list is the increase in the number of fires set by carelessness. This is due to the very large increase in the number of persons using the Forests for recreation. The careless smoker is responsible for most of these fires, and he is usually the visitor to the forest, the hunter, fisherman, or city camper. The prospector, settler, and woodsman are usually very careful with fire. There were in certain sections a good many fires caused by clearing land on homesteads. In many instances these were due to the State officials issuing permits during the dangerous period when no burning of brush should have been allowed. Incendiarism is very localized. Malicious setting of fires because of hostility to the Government is now rare. Such incendiarism as occurs is due to the mistaken "light burning" theory. Careful observation during the season showed that fires are in only very rare instances set to provide work in putting them out.

The danger of fires in September was so great that the Governor of Oregon consented to postpone the opening of the hunting season. It is probable that if he had not taken this action the number of fires would have been very much larger and the task of the Forest Service in preventing injury to the forest would have been greatly increased.

THE RESULTS SECURED

Of the entire 6,112 fires reported up to December first, 4,954 or 81%, were extinguished by the protective organization before they had covered ten acres. This is the best record in the history of the Service. Preliminary estimates show that the area burned over will probably not exceed 300,000 acres. The bulk of this area, probably 65%, was on old burns, and on brush and grass lands. In fighting the fires the effort was to keep the fire as far as possible out of green timber. The effort was very successful, for the total damage to green timber was probably not over $450,000. This is in marked contrast to 1910 when 6,500,000,000 feet of timber was burned, valued at from ten to fifteen million dollars. The damage to reproduction will probably considerably exceed that to green tim-

ber. It is an interesting fact that during the last 5 or 6 years, the ratio between the damage to green timber and that to reproduction has steadily decreased. In 1909 the damage to green timber was about 65% and that to reproduction 35% of the total. In 1913 timber damage was 40% and reproduction damage 60%. This year the ratio will be about as in 1913.

The measure of efficiency of the fire protective work on the National Forests should be the value of the property which was threatened and which would in all probability have been destroyed if the expenditure in protection had not been made by the Department. While every possible means is taken to prevent fires from being started, it is absolutely essential that such fires as are started be extinguished as soon as possible, for under conditions such as prevailed during the past season almost any one of the fires which were put out by the Forest Service was a potential disastrous conflagration. In Montana and Idaho alone the value of specific bodies of timber which were threatened by the approximately 2,000 fires which started and were put out, aggregated the enormous sum of over $59,000,000. It was in this section that the largest amount of money had to be spent to prevent a recurrence of the great disaster of 1910. In Oregon and Washington, the 1,200 fires which were handled by the Department threatened upwards of $24,000,000 worth of timber. And these figures do not include the value of nonmerchantable timber and young growth on about 5,000,000 acres of land, and several million dollars worth of ranch and other private property which lay in the path of the threatening conflagrations. Figures are not yet at hand of the precise amount of damage threatened by fires in California and other National Forest States. These data will, however, add large amounts to the total value of the property threatened and saved.

There were two lives lost, one in Montana and one in the Pacific northwest. In each case the man was struck by a falling tree. It will be recalled that in 1910, 78 fire fighters were killed. There were this year a number of injuries but chiefly of a minor character.

REASONS FOR THE FINE RECORD

The explanation of the success in preventing a great disaster during the past season is given in the single term "preparedness." Within the last four years great forward strides have been made in equipping the forests and in the organization of the force. In the first place, during that time there have been added 1,368 miles of roads, 9,617 miles of trail, 12,000 miles of telephones, 300 new fully equipped lookout stations, 695 headquarter buildings, and many other improvements. The forests have had a great increase of equipment in the way of tools and tool caches, portable telephones, tents, etc. Transportation facilities have been provided either by purchase of pack horses or arranging for hire of animals and automobiles.

Fully as great a factor, however, has been the organization of the force. During the past four years careful fire plans have been developed for all the forests, the protective force has been reorganized so as to have available a maximum patrol during the dry season, the system of detection and patrol has been intensified, arrangements have been perfected to secure at short notice labor for fire fighting, a system has been developed for officering the fire fighters by experienced foremen, and the force has been trained in the swift establishment of headquarter camps, with the necessary equipment and supplies. The fire organization worked with admirable efficiency when the test came this year.

As a single illustration, a ranger in one of the Oregon Forests stationed two miles from town received a report by telephone from a Service lookout of a fire 12 miles away. He saddled his horse, rode to town, secured four automobiles and 20 men and was on the fire line within 48 minutes after receiving word about the fire. Instances of similar and equally swift work could be recounted in large numbers.

As showing the increased efficiency of the organization over former years may be cited the results on the Colville Forest. In 1910, with 62 fires, 155,200

acres were burned, with a cost for fire fighting of $18,000; in 1914, with 103 fires and a drier season, the total area burned was 7,653 acres, with a cost for fire fighting of $15,900. Still again, in the Tahoe Forest in 1910, there were 84 fires, and such a serious situation developed that United States troops were called upon for aid. This year 223 fires were handled by the organization without help, and the loss was less. On the Trinity Forest 51 fires in 1910 burned over 23,191 acres; and in 1914, 53 fires burned over 459 acres. In California, the average acreage per fire in 1910 was 653 acres, in 1914 it was 37 acres; while the average for fires in the timber, excluding brush fires, was this year only 15 acres.

COST OF FIRE PROTECTION

A very large number of the fires were extinguished by the regular standing organization without hiring additional help. Fully 50% of the fires were put out by the rangers and guards before they reached a quarter of an acre in extent. When a fire was discovered that could not be so handled assistance is secured immediately. The local officers are authorized to hire men and they act swiftly. A delay due to the fear of possibly bringing a few unnecessary men to a fire is disastrous. This was repeatedly shown on private lands when owners hesitated because of the possible expense. The result was in the end great loss and great expense in fighting the fires because these were allowed to become large conflagrations.

The total expense of fighting fires was about $670,000. This is in contrast to over a million in 1910. The cost per acre, even where the emergency expenses were greatest, was less than many private owners spent outside the forests under conditions even more favorable than those faced by the Government.

The Forest Service has had its most successful season thus far in protecting the National Forests.

PROSPECTIN'

Up the mountain and through the burn
We climbed. An' 'mongst the brush an' fern,
An ole man drove his maddock home,
An slapped a tree in the gapin' loam.
"Mornin', Father. What's the game?"
"Plantin' trees," the answer came.
"*You* don't 'spect to live to see
The standin' timber, do ye, say?"
He looked, reflectin', down the hill;
"Wal, no." "But, thunder, *some* 'un will."

—J. R. SIMMONS.

THE MT. LASSEN ERUPTION

By RICHARD H. BOERKER

MT. LASSEN, the only active volcano in the United States proper, is situated in the southeastern part of Shasta County, California, and is the last of a series of great volcanic cones which begin with Mt. Rainier in Washington. In years gone by this series of volcanoes was instrumental in upbuilding the mountainous region of the Pacific Northwest.

The first eruption occurred in the latter part of May, 1914, and it is stated upon good authority that the first outbreak seen by local inhabitants was on May 29. Since then fifty or more eruptions have occurred and with very few exceptions these have been of ever increasing violence. The last eruptions of which the writer has any knowledge are indeed said to have been accompanied by luminous bombs and fire.

The writer had the good fortune of being stationed in the proximity of Mt. Lassen most of the past summer and witnessed many of the eruptions. The first trip made to the summit was accomplished on June 4, and the trip, made for the most part over deep snow, wound up on the summit in a howling snowstorm. We were compelled to spend the night at the brink of the hissing crater in the Fire Lookout Station on the topmost pinnacle, 10,437 feet in the air. The next morning, June 5, the mountain was lost in the thick haze and snow clouds and practically nothing could be seen until noon time. At that time the descent into the old crater was made and the new crater was viewed. The huge gap measured 275 feet long and evidently was then in one of the pauses between heavy explosions. Thick volumes of

MT. LASSEN'S HISSING CRATER ON SEPT. 3, 1914.

THIS CRATER'S MOUTH WAS EIGHT HUNDRED FEET LONG AND FROM ONE HUNDRED TO FOUR HUNDRED FEET WIDE AND ABOUT ONE HUNDRED FEET DEEP. NOTE THE FIGURES OF THE THREE MEN ON THE RIGHT HAND SIDE OF THE CRATER, AND THE STEAM AND SMOKE ON THE LEFT HAND SIDE. THE PEAK IN THE BACKGROUND IS ALMOST HIDDEN BY THE SMOKE HAZE.

steam, laden with sulphur smoke were rising and cracks were appearing in the ground. The walls of the crater were perpendicular and huge icicles hung from the rim of the crater formed by the condensation of the steam rising from either end in huge volumes. On the west side of the crater everything was covered with a heavy blanket of light gray ash into which we sank over our boot-tops. So light was this ash that it flew into the air at every step. On the east side the same material seemed to have been thrown out in the form of mud and lay frozen hard as rock. What little snow remained near the crater was buried under a layer of stones and boulders. The larger boulders had sunk down into the snow, creating many treacherous pits.

The eruption of June 14 was the heaviest one up to that date. It occurred at a time when several visitors were viewing the crater and almost resulted fatally for one of the party. There have been many narrow escapes and daring ascents during the summer, most of which will never be recorded. Hundreds visited the crater during July and August and the fact that they were taking their lives in their hands seemed to have little effect upon their eagerness to see the hissing crater. The eruptions do not seem to occur with any regularity. Some days there are as many as three, all very violent, and then again there may not be an eruption for two weeks. Many of the eruptions have lasted several hours and sometimes there would be a series of eruptions, one following another.

Many geologists and volcanologists were attracted by the violence of Mt. Lassen and paid the mountain a visit. Some made several ascents. All in one accord they gave their opinions that the old mountain was a real volcano and no imitation. They predicted earthquakes and they came. Some predicted that the volcano would become very active and actually become dangerous. This stage has almost been reached, judging from the latest reports. In fact, there is no reason for overlooking the possibility of lava flow accompanied by destruction of plant and animal life.

Photo by R. H. Boerker.

BEGINNING OF THE BIG ERUPTION.

THIS WAS THE FIRST COLUMN OF STEAM AND SULPHUR VAPOR WHICH WAS SEEN TO SHOOT HIGH IN THE AIR.

Being engaged in making a map of the high country around Mt. Lassen, the writer made the ascent of about a dozen peaks in the vicinity of the old volcano and also climbed Lassen several

VULCAN HIMSELF.

IN THIS NOVEL FORMATION OF THE SMOKE CLOUD HANGING OVER MT. LASSEN AFTER A PARTICULARLY VIOLENT ERUPTION THE AUTHOR SNAPPED HIS CAMERA JUST IN TIME TO CATCH THE STRIKING PROFILE SEEN SO DISTINCTLY ON THE LEFT EDGE OF THE CLOUD. IT IS OF VULCAN HIMSELF.

times. The base camp was established only 2 miles from the rim of the crater and from this camp, at an elevation of over 8,000 feet many excellent pictures were possible. Many eruptions were witnessed in all their grandeur and the rumblings and tremors of the earth often made one wish he were elsewhere.

The ascents of the peak made by the writer in the latter part of August and the beginning of September were made for securing triangulation points for a general map of the region. Plane table work at the brink of an explosive volcano is not the pleasantest job imaginable, hence such visits were usually made as brief as possible and not any oftener than was absolutely necessary. These ascents showed that the crater had increased considerably in size since June. The crater was at the beginning of September about 800 feet long and 350 feet wide and the country for at least a mile around was covered by a thick blanket of light volcanic ash. Practically all the snow that was left on the mountain was covered by this ash and the water it soaked up from the snow made it look black. Hence Mt. Lassen this summer not only acted like a volcano but decidedly took on the ghastly appearance of one. The Forest Fire Lookout Station was at that time still standing but the roof and sides had numerous large and small holes in them. One noticed, while walking over the rocks and volcanic ash on top, numerous large depressions in the ash and rock where large boulders had fallen. These holes occurred as much as a mile from the crater and they serve as evidences of the severity of the explosions.

Up to the present time there has been no destruction of life of any form. No timber or other natural resource has been destroyed as far as the writer knows. The heavy clouds of ash laden steam that are thrown out of the crater at the time of an eruption are often carried by the wind for many miles. The most violent of these eruptions have sent these clouds with the help of the wind for 20 miles or more. The height to which these great columns of vapor are thrown has been quite accurately determined by Forest Ranger

Photo by R. H. Boerker.

THIRD STAGE OF THE ERUPTION.

THICK BLACK ASH LADEN STEAMS COVER THE ENTIRE MOUNTAIN. SOMETIMES THIS IS CARRIED FOR FIFTEEN OR TWENTY MILES. THE ENTIRE TOP OF THE MOUNTAIN IS COVERED WITH THIS FINE VOLCANIC ASH TO A DEPTH OF EIGHT OR TEN FEET.

J. M. Stark of the Turner Mt. Fire Lookout 15 miles to the southwest of Mt. Lassen and his figures range up as high as 25,000 feet for the most violent eruptions.

Many conflicting stories have been circulated concerning this mountain, especially by newspapers. No accounts should be considered authentic unless they emanate from such sources as the United States Forest Service or the Geological Survey. The tremendous interest that this volcano has aroused in all parts of the world will undoubtedly make it a Mecca for tourists next summer. Being in the heart of the National Forest Region of California it will be visited by thousands of campers next summer.

FOREST PRODUCTS FEDERATION

By E. A. STERLING

AT a preliminary meeting called by the National Lumber Manufacturers' Association in Chicago on December 17, a tentative organization was created which combines under one head, as never before, the manufacturing, wholesale and retail lumber interests for the mutual benefit of all concerned.

The primary object is the better merchandising of lumber and solution of the related problems which this subject involves. The organization as inaugurated, opens the way for developments of great importance to the lumber industry and forest interests in developing a policy which will insure the continued use of wood in all situations for which it is best fitted. This in turn should bring about closer utilization and more rational use of forest products. If the new organization fails to grasp the larger opportunities, and to make definite progress along the lines indicated, it will demonstrate the inability of the lumber interests to cooperate broadly to their mutual advantage and will produce wide economic evils in an industry which is second only to agriculture in magnitude and importance.

The specific accomplishment at this preliminary meeting was the acceptance of a plan for the creation of a Forest Products Federation and the appointment of a committee of five to have general charge of arrangements for a mass meeting to be held two or three months later. The representative character of the Federation is indicated by the personnel of the committee of five, which is as follows: R. H. Downman, New Orleans, La., president, National Lumber Manufacturers' Association; Gordon C. Edwards, Ottawa, Ont., president, National Wholesale Lumber Dealers' Association; L. W. Crow, Chicago, Ill., president, Lumberman's Association of Chicago; Julius Seidel, St. Louis, Mo., wholesale and retail lumber dealer; J. R. Moorehead, Kansas City, Mo., secretary, Southwestern Lumberman's Association.

While the program for the coming meeting will not be definitely announced until after a conference by the committee, the general character of the work is indicated by the suggestions of Chairman J. E. Rhodes, in his opening address at the preliminary meeting. In this talk Mr. Rhodes suggested the following topics for consideration, some of which will no doubt be considered and reported upon by standing committees at the first general meeting of the Federation. The topics mentioned by Mr. Rhodes include:

Building codes.

The comparative price of lumber and other materials.

What is being done to advertise substitutes for wood.

Definite information regarding the fire prevention movement, and the part which wood plays in creating a fire menace to public life and property.

The wooden shingle in relation to fire prevention.

Educational work regarding the right use of wood, so that the wood used may accord more closely to the service requirements.

Information regarding the preservative treatment of wood against decay.

The meeting was addressed by various men, including Dr. Herman Von Schrenk, consulting timber engineer of St. Louis; L. W. Crow, president Chicago Lumbermen's Association; F. A. Hofheins, of the Transfer Lumber & Shingle Company, North Tonawanda, N. Y.; Julius Seidel, wholesale and retail lumber dealer, St. Louis, Mo.; Henry F. Weiss, of the Forest Products Laboratory; Abram W. Herbst, of the American Society for Fire Prevention, and others who represented lumber associations and city and county lumber yards.

The topics discussed included general fire prevention and the specific problem of fire-proofing wood; the anti-wood publicity and legislation in many towns and cities; the problems of the wholesale and retail dealers; while as having direct bearing on the meeting, the specific question of the necessity for close cooperation between all branches of the lumber business was thoroughly discussed.

The work before the committee of five and the individuals and committees to whom subjects are assigned for presentation at the first meeting of the Federation, is of large magnitude and great importance. Some of the subjects will require extensive investigations and cannot be reported upon in full for some time; while other topics such as building ordinances are urgent, the definite plans for combating unfair legislation should be available in the near future. The whole range of topics gives a field for immediate and future consideration and report, which will require careful organization of the work and a liberal use of funds to support it. It is a logical assumption that the reports of the first general meeting will largely deal with the development of plans and policy.

If any suggestions were to be made regarding the Forest Products Federation, they would include reference to the need of more funds for the work of the immediate future and of a definite plan of financing future work. It might also be suggested that closer cooperation be arranged with organizations outside of the lumber industry. For example, several of the States have well organized forest departments, with State foresters, who have received strong public support, and who could be of great assistance in legislative activities and general investigations. The American Forestry Association, the stronger State association, and some of the forest schools and agricultural colleges could also offer effective assistance and cooperation.

Motors for Forest Fire Fighting

Experiences with forest fires on the national forests this year show that automobiles, where they can be used, furnish the quickest and cheapest transportation for crews of fire fighters. Motor rates are higher than those for teams for the actual time employed, but the total cost per distance traveled and in wages paid to men in getting to fires is much less. The time-saving is self-evident; trips which ordinarily require two days time by team have been made by automobile in a few hours.

THE ANNUAL MEETING

MEMBERS OF THE AMERICAN FORESTRY ASSOCIATION WILL MEET IN NEW YORK CITY ON MONDAY, JANUARY 11, 1915

To Members of the American Forestry Association:

You are urged to attend the 34th annual meeting of the *American Forestry Association*, in the Woolworth Building, 233 Broadway, New York City, on Monday, January 11, 1915.

There will be morning and afternoon sessions at 10 o'clock and 2 o'clock, and in the evening an informal dinner at the Hotel McAlpin, Broadway and 34th Street, at 7 o'clock, at which there will also be addresses.

The meeting will be essentially practical. Its chief purpose is to have addresses and discussions on how the Association may be of the best service, during 1915, to the several phases of forest conservation, national forestry, state forestry, private forestry, forestry for lumbermen, forestry for paper and pulp men, use of forests for recreation, etc.

The addresses on these subjects will be by recognized experts on each, and the discussions will be participated in by the members and guests.

Members who expect to attend will please notify the Secretary.

Reservations for lunch in the Rathskeller of the Woolworth Building at 12:30, price $1.00, *must be made in advance.* Reservations for the dinner at the McAlpin Hotel at 7 o'clock, price $2.50, *must be made in advance.*

Members may bring friends and may make luncheon and dinner reservations for them.

This is the first annual meeting of the Association in New York, and as it is a convenient point for members in the East to gather, a large attendance is expected and requested.

HENRY S. DRINKER, President.
P. S. RIDSDALE, Executive Secretary.

Members of the *Society of American Foresters* and of the *Society of Eastern Foresters* will meet with *The American Forestry Association.*

THE PROGRAM.

Discussions of fifteen or twenty minutes will follow each address.

MORNING, PRESIDENT HENRY S. DRINKER PRESIDING.

10:00. Address of welcome. President Henry S. Drinker.
10:10. How the American Forestry Association Can Cooperate with the Forest Service. Henry S. Graves, Chief Forester of the United States.
10:45. What the American Forestry Association Can Do for State Forestry. By C. R. Pettis, Supt. of New York State Forests.
11:35. The Service the American Forestry Association Can Render in Educational Work. Dean Hugh P. Baker, New York State College of Forestry at Syracuse University.
11:50. How Can the AMERICAN FORESTRY MAGAZINE be made more useful and attractive? W. B. Howland, Publisher, *The Independent*, John Oliver La Gorce, Associate Editor *The National Geographic Magazine.*
12:30. Adjourn for lunch.

AFTERNOON, CHARLES LATHROP PACK PRESIDING.

2:15. What Shall Be the Policy of the American Forestry Association towards

Proposed Forestry Legislation? Prof. H. H. Chapman, Yale Forest School.

2:45. What Practical Assistance Can the American Forestry Association Render to the Lumber Industry? R. S. Kellogg, Secretary Northern Hemlock and Hardwood Association.

3:15. What Can the American Forestry Association Do to Stimulate Private Forestry? Samuel N. Spring, Professor of Forestry at the New York State College of Agriculture at Cornell University.

3:45. What the American Forestry Association Can Do to Encourage the Use of Forests for Recreation. By Warren H. Miller, Editor of *Field and Stream.*

4:15. Adjourn.

4:30 to 6:30. Business Meeting of the Society of American Foresters.

EVENING, CHARLES F. QUINCY PRESIDING

7:00. Dinner at the Hotel McAlpin.

8:00. What the American Forestry Association Might Do on the Pacific Coast with Special Reference to the Proposed Meeting at the Panama-Pacific Exposition. E. T. Allen, Forester of the Western Forestry and Conservation Association.

8:30. What the American Forestry Association Might Do for Eastern and Canadian Pulp and Paper Interests. George N. Ostrander, Glens Falls, N. Y.

8:50. What the American Forestry Association Can Do in Helping to Solve Lumber Trade Problems. E. A. Sterling, Forest and Timber Engineer.

9:10. What We Can All Do to Get Together. Speaker to be selected.

THE FOREST RANGER'S PRAYER

O LORD, grant that as I make this survey called Life I may find pleasant camping-places; that the cool waters of congenial companionship may flow past my tent door; that the woods of hardship wherein we must all walk be not too heavily clad with the underbrush of hard luck; that the nettle called remorse grows not too abundantly there; that there be springs of friendship and shade of rest trees wherewith to refresh myself; that cooling breezes may blow sometimes across my forehead and drive away the remembrance of wrong deeds done and righteous deeds left undone; that as I lay out the logging-road of my life the curves thereof be tangent to Thy will and the spirals be true; that there be a down grade from my will to Thine, and that the superelevation be correct so that as I swing around the curve I may not leave the track that leads to Heaven.

LORD, grant that when the appraisal of my life is computed it may not exceed Thy original estimate; and, Lord, when I take an observation to obtain my true bearing, grant that my transit be in perfect adjustment so that I shall not deviate even so much as one second from the sight which Thou hast set at the end of that long tangent which leads through the portals of gold into the District where Thou art Chief Forester. I pray that when my road is built there shall be no trails left unblazed and no dangerous rocks or trees above the cuts to endanger the safety of any travelers over this route.

LORD, in Thine infinite tenderness, mercy, and love so encompassing that even I am included in Thy promise, listen to my prayer; and grant, finally, that when I turn over my field notes to the Chief and sign my last report He will say "Well done!"

AMEN.

BONDING NATIONAL FORESTS

By HENRY S. GRAVES,
Chief Forester of the United States

[In his annual Message to Congress, Secretary of Agriculture Houston recommends that Congress advance money to communities in and adjoining national forests on which there are few or no timber sales; this money to be repaid from future resources of the forests. The idea is to furnish these communties with money to build roads, to construct bridges and otherwise provide for their development, such money to be given only where it is apparent that the 35% of the gross receipts of future timber sales on the forests, to which the communities are entitled, may be used for repayment of the sum thus advanced. Chief Forester Graves, who worked out the details of the plan, explains it in this article—Editor.]

ALREADY the ideal of the National Forest policy is being achieved in practically all respects on a number of the Forests where conditions permit of the full utilization of all resources—timber, water power, grazing, mining, agriculture, and the recreation features. On those forests the communities are being built up through the establishment and maintenance of industries using the forest resources; there are also thousands of dollars returned directly from the forest receipts for schools and roads. In short, the forests yield a direct return equivalent to taxes and it is an increasing rather than a diminishing return such as would follow forest destruction such as has taken place so extensively in many regions under private ownership.

But in many of the forests the resources are inaccessible and the greatest resource, the timber, is not saleable under present conditions, except in small quantities. Under such circumstances, the development of the forest resources is slow, and there is but little direct return to the communities from forest receipts. While all agree that ultimately these forests will be of enormous importance to the country, people can not reconcile themselves to the fact that the forest resources are of no immediate help now, during the pioneer period of development of the country and at the time when such help is most needed. A great deal of the land in the counties in which the most heavily timbered national forests are located is still in the condition of practical wilderness. The very foundation of any development in such sections is the construction of roads and bridges, and this is in many places enormously expensive. The clearing of the land for farming, the building of the homes, the building of schools, churches, and public improvements in the towns, in addition to the road building, are the burdens of a small struggling population, composed largely of men possessed of great perseverance and courage but with little means.

In many cases the national forests occupy from 20 to 60% of the area of the counties and contain timber of vast amount. Is there any wonder that the people are protesting that the forests which are not subject to taxes and are not yielding much from timber sales are not contributing as they should to the development of their communities? Often they use the phrase that the forests are blocking development or that the resources are locked up. This is, of course, not true, because the resources are available for use. What is meant and what is true, is that the forests are not contributing as they should to development of the communities living in the counties in which the forests are located.

This is a problem that the Government must squarely face and solve. But it must be met by a constructive program and not by tearing down the national forests, as some propose, which would result in public loss and injury not only nationally but locally.

A CONSTRUCTIVE PLAN

A plan which will fully meet the situation and at the same time be entirely practical to apply is as follows:

Congress has made a continuing appropriation of 35% of the gross receipts from the Forests to aid in community development and maintenance. Inasmuch as the objects of this provision can not be accomplished at present where the timber is inaccessible and unmarketable, a modification of the present plan is proposed to make these heavily timbered forests serviceable to the people at the present time during the most severe pioneer stage of the region's development. The proposal is that where the existing resources justify it and the public need can be shown, future receipts be anticipated and advances be made by Congress for the construction of roads, bridges and similar public works, these advances to be returned to the Treasury from the sums which will be received later on when the timber can be placed on the market. If need be, the advances could be deducted from the amounts which would later go to the communities as their share of the gross receipts from the forests. In such an event the Nation would not be making a new contribution to the communities, but merely advancing a portion of what they would ultimately receive anyhow.

APPLICATION OF THE PLAN

In application the plan would call for a specific appropriation for individual projects, each of these to be considered separately and on its merits. Probably the simplest procedure would be to use the county as a development unit rather than a National Forest which might spread over several counties. The question of whether in any given county the Government should make advances on the basis of its forest resources for the benefit of the community development would depend wholly upon the public need for such advances and upon the resources in the National Forest comprised within the county which could be used as security for the advance. In short, we are dealing with a question of public business and no advances should be made except upon an adequate showing that existing resources are amply sufficient to cover the outlay. Thus Congress would be in the position of a board of directors of a banking institution passing on a loan. The showing of the public need and of the resources which are to repay the advances would be made by the Secretary of Agriculture through the Forest Service.

The procedure in the case of a given county would be somewhat as follows: The Forest Service and the local county officials would cooperate in the study of a county's needs for public improvements, not merely within the boundaries of the National Forest but in that portion of the county outside of the boundaries and adjacent to the Forest. The public improvement which would usually be desired would be the construction of roads and bridges. In the majority of cases the immediate purpose of such development would be to make the agricultural lands more accessible to the market. In many cases the purpose would be to open up new agricultural regions, as for example, in the logged-off lands outside of the National Forests, such as occur in great quantity in the Northwestern States. In some instances the purpose of the roads would be to open up a mining region. In still other cases it is possible that the development of the recreation resources would be the most important need of a region. Such a study would result in a general plan of needed development of public works, including the determination of the specific roads or other works which should be undertaken immediately. This plan would show also the direct public service which would be rendered by the improvements in the development of agriculture and other resources and the benefit which would result to the public at large.

In addition there would be prepared by the Forest Service a full statement showing the amount of timber and other resources in the National Forest within the county and the receipts that can conservatively be anticipated as soon as these resources can be realized upon.

In short, a business statement would be prepared which would demonstrate the desirability and soundness of the proposed expenditures and their justification from the standpoint of the National Forest resources as a security. It is not unlikely that Congress would be unwilling to make such advances as are proposed on the basis of general estimates of cost. It is probable, therefore, that the first appropriation for public works in a given county would be for surveys and estimates with a view to making a final appropriation after the completion of the surveys by the road engineers.

The plan contemplates further that the actual work of construction of roads and other improvements would be under the direction of the Government engineers. The Department of Agriculture is well equipped for such work in its Office of Public Roads. The purpose of this provision would be to guarantee to Congress that the work would be carried on in accordance with consistent engineering methods and standards and with the highest possible efficiency and economy.

One of the first questions that will be asked is how a beginning is to be made in setting this plan into motion. Probably the best plan would be to request general authority for the Secretary of Agriculture to report to Congress from time to time, with necessary surveys and estimates of cost, his recommendations concerning the construction of public works in the National Forest counties where, in his judgment, the public need requires it and there are resources within the National Forests lying within the counties sufficient ultimately to repay the cost of such improvements. With such authority the Secretary of Agriculture, through the Forest Service, could take the initiative in recommending legislation. If such general authority were granted, it would necessarily carry a recognition of the fact that appropriations would be made only upon a showing by the Secretary of Agriculture of their justification and need. Such a procedure would be an effective guarantee against the initiation of ill-advised projects and would result in the most urgent cases being considered in the order of their importance.

The first objection which will be urged against the plan is that there would immediately develop a competition among different counties for advances from the federal government for road building and that there would be danger of sectionalism developing, and perhaps such a condition as is claimed to exist in connection with the Rivers and Harbors Bill.

It should be remembered, however, that the present plan is very different from the Rivers and Harbors problem. In that case there is a direct contribution by the Government. In the present proposal, there is merely an advance by the Government, in urgent cases, of moneys which later on will be returned to the Treasury from the resources, held and fully controlled by the Government itself, and a portion of which Congress has already decreed shall ultimately be appropriated for these very purposes. Handled as a proposition of public business, with the expenditures guaranteed by existing resources, and with the certification of the Secretary of Agriculture as to the public need and as to the engineering features, there should be ample safeguard against unwise projects being undertaken.

SOME ILLUSTRATIONS.

It is evident that the plan would not be applicable by any means to all of the National Forest counties. Many of the National Forests are already being developed and used to such an extent that the receipts are now bringing into the counties very substantial sums, in some instances fully as great as would be received if the lands were under taxation, and these are receipts which will be constantly growing for an indefinite period. Examples of Forests yielding large revenue are the Kaniksu of Idaho, with a gross revenue of $54,000, the Kootenai of Montana, with a gross revenue of $41,000, the Deerlodge of Montana, $80,000, the Coconino of Arizona, $100,000, the Whitman of Oregon, $72,000, the Lolo of Montana, $40,000, the Sierra of California, $22,-

000, the Tusayan of Arizona, $64,000, and there are many others which now yield very substantial returns. Under such circumstances there certainly is not the same need of making advances on future receipts because the citizens are already receiving a direct contribution from the forest resources for local institutions. Then again there are some forests with relatively little timber value which were established and are maintained not so much to produce forest products as to protect the water used by the local communities in irrigation, for domestic supply, and other purposes. In such forests the receipts may be very small now and in the future.

Obviously the local communities are already receiving very large benefits from these forests in the protection of their water and advances would not be made to them for this reason, and also because the resources are not of a character to justify it. Still again, certain forests have in the past been so badly abused through forest fires and otherwise that it will be a long time before the timber which is now growing up will yield substantial receipts. There is no reason why under such conditions any advances should be made by the Government. In the first place, the resources do not justify it and it happens that on most of the forests in this condition there are considerable receipts from grazing which constitute a substantial contribution to the community upbuilding.

The situation may best be illustrated by a few specific examples. We have on the Olympic Peninsula an extreme illustration of the need of applying the proposed plan of making advances for the public improvement. The Olympic National Forest occupies 62 per cent of Jefferson County and 46 per cent of Clallam County. The Olympic Forest carries the largest body of timber of any of the National Forests of its size. Surrounded as it is by private timber lands which are much more accessible, it has not been possible to place any considerable amount of the Government timber on the market at the present period of great depression in the lumber industry. There has been, therefore, very little return to these counties from receipts from the National Forests. A great deal of these counties is still in a state of wilderness. Only a small beginning has been made in the construction of means of transportation. The conditions are such that the construction of serviceable roads is extremely expensive. The people of the counties have bonded themselves heavily in order to build roads, and with such funds as they are able to raise in this way only a small part of the work can be done which is necessary to lay the foundations for the development of the agricultural and other resources of the counties. The development problem of these counties is first of all to open up the logged-off lands outside the National Forests and to establish upon them permanent homes. This cannot be done without roads and the relatively small population already heavily burdened with taxes cannot possibly meet the situation. The Olympic National Forest contains at least 33 billion feet of timber. Ultimately there will be a return of from $300,000 to $500,000 a year gross receipts from this forest. Pending the time that these timber resources can be realized upon, they certainly should be made to make some contribution to the development of the counties through the plan of federal advances such as is being proposed. In my opinion, if the plan which has been outlined in this paper is adopted the first projects which should be given consideration by Congress are in Jefferson and Clallam Counties in Washington.

A number of other very urgent examples could be given, such as Curr County in Oregon, where 64 per cent of the county is in a National Forest and where there is at the present time very little return to the communities from the forests because of the inaccessibility of the timber and other resources and where there is a most urgent need for road development in order to open up the resources surrounding the National Forests as well as those within its boundaries. The small population, 2,044 people, cannot

undertake this work. The Government should help and I believe that it is entirely practicable for the Government to give help under the proposed plan.

Another urgent case is in Trinity County, California, where the National Forest covers 58 per cent of the county. This forest has a stand of over 13 billion feet of timber, which ultimately will bring in gross receipts of considerably over $100,000 a year, but which at the present time returns to the county only a little over $2,000. There are only about 3,500 people in the county. Its county seat is 50 miles from the closest railroad by mountain wagon road, and many of the people of the county have to pack their supplies over mountain trails because there are no roads at all. An advance by Congress on the basis of later returns which certainly can be secured from timber which is owned by the Government, but which cannot be marketed at the present time, would open the way to developing this section of California. Other illustrations could be given in the Coast States and in some of the interior States where there is heavy timber but so located that it cannot immediately be developed on account of its inaccessibility and lack of market. Such are the projects which should be taken up first.

Probably the suggestion of the foregoing plan will bring up many questions regarding the detailed operation of it in practice. For example, the question of maintenance of the roads would arise, whether the counties or the Government should assume this burden. Again, the extent of cooperation on roads in which the counties and the Government, and perhaps also the States, would participate would constitute a problem here and there. In planning a given project these questions should be considered and a solution in each case be worked out before asking for the advance from Congress. I have no doubt of the earnest cooperation of the communities, if I may judge by the way they are working with the Forest Service in such road building as is now being carried on in the forests.

RESULTS OF THE PLAN

The proposed plan would make the public benefits of the National Forests immediately realizable; it would accomplish development not possible for the communities without public aid and would stimulate agriculture and other industries and result in the building up of many permanent homes and bring into use great quantities of land now lying idle; it would relieve the now struggling communities from a burden of taxation which otherwise they would have to assume if the development of many of the National Forest communities is to go forward as rapidly as it should; it would hasten the development of the National Forest resources themselves which are now in many cases unavailable because of lack of transportation; where roads are built in the Forests there would be an added security because of their direct use in forest fire prevention; the plan would work to the benefit of the small man in every way; and finally, there would be a clearer appreciation on the part of local communities of the important public benefits of the National Forests, and in consequence of the present realization of the purposes of the National government in this enterprise, there would be a closer cooperation between the people and the public agencies with the result of a more effective protection and administration of this property than otherwise would be possible.

Russia's Embargo on Lumber

The Russian government has placed an embargo on all kinds of lumber, to prevent its exportation; walnut lumber, including Circassian walnut, much prized by American furniture makers, is specifically mentioned.

THREE MILES OF FLAME

A CROSS-COUNTRY RIDE AND THREE DAYS OF WORK WITH A FIRE WARDEN IN NEW ENGLAND

By Allen Chamberlain

["I would like to establish the fact that all the picturesqueness and all the heroism in forest fire fighting isn't confined to the West," wrote Mr. Chamberlain in contributing this story. "During the drought this autumn there was a deuce of a fire in the Berkshire country that narrowly escaped developing into a calamity. I have attempted to relate in short story form the cold, hard and wholly unadorned facts concerning that fire."—Editor.]

"HELLO, warden! Back home again, are you? Then all this smoke doesn't mean that the woods are still afire back in the hills?"

"Well, all I can say is that, so far as I know, the fires in this district are out, or under control. Perhaps I'd better knock on wood, though, for something may start at any minute with the country as tinder dry as it is right now. If I could see a sprinkle of rain I'd turn in for a solid twenty-four hours of snooze. 'Believe me,' I could give the finest imitation of a man sleeping that ever was. In the last three days Jim and I have managed to edge in just about one night's sleep. Oh, yes, this fire warden business is a cinch—when it's raining."

In seven weeks there had been no rain in the hills—oh, perhaps what the Weather Bureau calls "a trace," a mere dew—but no real rain. It was as dry as a California summer, and yet it was October in New England. No rain, and persistent summer temperatures, made golden weather for pleasure parties out to see the autumn color on hill and dale. Then, too, the shooting season had just begun, opening on a holiday, which meant that thousands of men and boys with guns and matches had taken to the bush for one glorious day of killing.

It had been a worrisome seven weeks for every fire warden, and the State warden and his district deputies had lived a busy life chasing hither and yon at the summons of the local officials who needed aid or advice, for there was scarce a town that did not have its daily blaze. But mostly these district men were needed in the remote hill towns, communities big in land area, but little in point of population and financial means. In these places, where every man is a farmer, all hands are busy at this season trying to get in their harvest, but when fire comes they must drop these private affairs to fight the common enemy. In a little town with a mere handful of voters it isn't possible to "let George" do these things. All the "Georges" have to turn out, and if any hang back without good cause the law provides a substantial penalty. Besides it isn't healthy to be unneighborly in such matters in a small town. The neighbors aren't numerous enough to hide behind, and the shirker "gets in wrong" with everybody for miles around. How those farmers hated the sight of an automobile. Too often the passage of one through some piece of woods meant a call to the fire line within an hour, the result of a heedless smoker and his match or cigar stub. And the gunners were no less unpopular for the same reason.

On this particular balmy October evening, when the deputy warden of District 6 drove his dusty little runabout into the home yard, he and his helper had spent the best part of a week chasing fires from one end of the district to the other. Fifteen hundred square miles is a tidy little area to have to keep an eye on, and when seventy-five per cent of it is forest land, with plenty of slash-covered wood and timber lots sprinkled through, and the whole territory standing on end in hills and small mountains up to three thousand feet in elevation, a man has to be definitely "on to his job" in a dangerous fire time, and without much regard for three meals a day and slumber.

It looked a little like rain, and there was no wind. The chances for at least one night of sleep seemed hopeful. That day they had taken a look at two town crews that were fighting fair-sized blazes, and had spotted and stamped out three small fires all by themselves, just as an incident of the road. Small wonder that they were ready to stop a spell.

"Run the go-cart into the shed, Jim, and tank her up with gas and water for luck. And you better hitch on that extra fire pump, too. It might be handy sometime. Then come in and we'll pick up a bite and take a turn at that sleep act. Be sure the lamps are o.k."

What a relief to get home and to get a real wash-up and a square meal. It was the next thing to luxury.

"Now, Jim, who says that there aren't compensations in a warm, dry Fall? Just look at that dish of green corn. I didn't really expect that last planting to come to anything, but there it is, so 'go to it.' 'It's an ill wind that' —Drat that 'phone! Half a mind not to answer it."

But as he said it he was across the room in a jump and taking down the receiver.

"Hello! Yep, I'm the feller. Whose this? Oh, hello chief. Why, pretty fair, thanks. Not scorched yet, anyhow. Maple Mountain, did you say? Running toward the State reservation? I see. Yep. All right. We'll trot right over. Good-night."

"Well, Jim, we'll finish our supper, if you don't mind, but that sleep will have to be 'continued in our next.' That was the chief. The reservation commissioners have wired him that Maple Mountain is all a fire, and that it's runing straight for Whitetop. Why, there aren't two dozen men in that whole town, and they don't own a pump, or an extinguisher, or anything else to fight with. By, George! Just in the nick. Here's a waybill for some new fire pumps just in. Hike over and tease Jerry to open the express office and let you have those guns. Tell him it's an emergency. I'll chase you over with the car in a jiffy."

It was one of those nights known as "pitch dark" when stars don't seem to count. A merry prospect lay before the warden and his man, for it was full fifty miles across the hills, and over some of the roughest back country roads in the State, to reach that fire. By the time the new pumps were unpacked and lashed to the car it was past ten o'clock.

For a couple of miles they tore along the river road at good speed, and then began the tedious climb of a ten-mile hill, a steady grind of 100 feet in the mile, with many a stretch much stiffer. The men who settled those townships in Revolutionary days aimed at the summits of the long glacial ridges, and ran their roads straight for the goal and across, and quite regardless of grades. At the little hamlet stranded upon the Crest, two thousand feet above the sea, the car shot along the ridge, and then down the long "ladder" on the northern side into the valley of another river. A few miles of relatively level road across the bottom land, and again the car was thrust against the contours, straight for the mountain and the fire. Shortly after midnight, as they skirted the flank of the mountain, the blaze appeared above them, a continuous line of fire the entire length of the three mile long ridge.

It had been a wild Paul Revere sort of a ride across the dark, but even with the goal not only in sight, but right at hand, the riding was not yet over. The local warden must first be found, for although the towns like to have State aid in their times of trouble and distress, the dignity of their local sovereignty may not be ruthlessly transgressed nor overlooked by the officers of the State. It was one in the morning when they whirled into the little village center, and stopped in the yard of the local warden.

"Must be they're all out on the fire line, or else—Hello, here comes a light!"

It was the warden himself, and so dead beat and weary that he could barely keep his eyes propped. No, he didn't think anyone was on the line tonight. The fire had fought them to a standstill. Every man Jack was "all in." Couldn't get any outside help, and the town men were simply worn out after two whole

days of fighting. They had checked it, and if they only could have held out that night, or got a fresh relay of men, it would have been out by morning. The fire had started in the scrub of the higher ledges on the westerly side toward the village, had spread both ways on the long north and south ridge, and finally worked its way through a gap, and started down the easterly flank straight toward the State reservation. Someone had heard shooting up on the mountain the morning that the fire started.

Whatever else was done the reservation must be protected. It was clear that the local gang would be useless, even if called out, in their present state of collapse. There wasn't a telephone in the entire township, and it was a long rough road to the nearest sizable place where help could be had. But something must be done, and quickly.

"Get back to bed, warden. We'll take a scout around the mountain and be back for an early breakfast. You'll be feeling better by that time yourself."

And with that the little car was off for a circuit of the fire, the worst eight miles of the entire night, up and down breakneck hills, in and out through the woods, bumping over rocks and gullies, and its occupant nearly choked at times with the dense acrid smoke.

But they located the limits of the fire, and found the danger points and the vulnerable spots. At one place, where the flames were working down to within a few hundred feet of the road, but coming leisurely, as fires do on the down grade, they stopped and unlimbered a pump.

"We'll just put that bit of fire to the bad right now, Jim. If she jumps this road, and gets to climbing the big mountain across the notch here it will be 'good-night.' The whole county couldn't stop it in ten miles."

A handy brook furnished the ammunition, and it wasn't long before their gun had subdued an eighth of a mile of fire. For safety's sake they swept the road clear of leaves for a stretch, and after refilling the pump and leaving it beside the road for future use in case of need, the car was started for the village. At dawn they sat down to a hurried breakfast with the local chief.

"I'm thinking we can stop that fire today. We've got to, that's all. Where can we get fifty men? Can't you rout out a few of your neighbors and get them to drive around and hire some men? Of course you'll have to go outside your town, but the Billboro and Waytown folks will help you if you shout. And I want four teams with cider barrels to haul water. Now if you'll get after these things we'll furnish the pumps and take right hold ourselves with you. What do you say?"

Inside of half an hour three neighbors were off for outside help, and the warden himself was routing out his town crew and impressing the cider barrel outfits. Back to the mountain went the district warden where he found the reservation superintendent with two of his men, and by seven o'clock the crew began to arrive. All told forty men were rounded up, which made four good gangs of ten men each, with two ten-gallon pumps to a gang. It was high time for something to be doing, for the fire had crept down closer to the leaf-littered notch road at many points, and it was already beginning to wake up a bit for an active day.

It was a terrible temptation to try back-firing along that road, but the up-to-date warden is chary of resorting to that check. The risks are too great, and the situation must be desperate indeed to warrant this fighting of fire with fire. So it was slow and heavy work lugging the hand tanks up the hill to assault the steadily oncoming crackle.

Forty men on a three mile line do not present a very continuous front. A hundred men would have been none too many. It meant a stiff and steady fight for the forty. While they beat the flames back at one point they would eat ahead at another, and gathering headway, threaten to make all the work unavailing. Once over that road—and a single spark would take it there—and the jig would be up. The fire must not be given a chance at the slope of old Whitetop across the notch.

Up and down the road buzzed the little car carrying the keen-eyed and energetic State deputy, keeping touch with the whole situation. Did the fire

get too lively at some particular point, and threaten to get away before the nearest gang could work up to it, the car brought that gang at once. It was like the Highlanders being whirled into the charge by clinging to the stirrups of the Scots Grays, the men hanging to the running boards, on behind, anywhere for a foothold or a grip.

And so it went all the morning, and all the afternoon, too, food and hot coffee being brought along the line at noon by a city man whose summer place was threatened by the fire. By nightfall the enemy was under control, but the job was not yet finished. It must be kept under control, and so, bit by bit, put out.

A competent fire warden, like a general, must be considerate of his men. It would be a reckless extravagance in human energy to keep more men on the line that night than were absolutely necessary. Another fire might break out at any time in some other part of the town or section, and with everyone exhausted, and unable to put up another ounce of fight, there would be nothing to do but to let it burn. The men who had borne the brunt of the battle that day, full half the crew, were sent home to sleep. The rest were summoned to another meal, and while they toyed with sandwiches, hot soup and coffee, the warden regaled them further with a bit of his choicest table talk.

"Boys, I'm sure enough tickled with the way you've stood to this game today. You've got things in shape now for a clean knock-out if you'll stick to it tonight. The scrap isn't going to be quite so strenuous from now on. What fire there is left wont be very energetic between now and morning, unless we should get a big breeze, which doesn't seem likely. All we've got to do is to keep on soaking it, and by morning a handful of guards can handle what's left. We'll try the scheme of putting in the night in two watches. No. 1 crew can go out on line now, I'll set you along the road with the machine, a couple here and a couple there, and keep in touch from time to time. No. 2 crew can take a leaf, and catch forty winks till their relief time comes, unless an emergency spoils their dreams."

The men were game, and the supper had put new gimp into them. All spots that still showed a lurking vigor were given first attention, all smouldering logs and stubs were drenched down, and everything was going to the Queen's taste when, along about midnight, and quite without warning, the wind hauled south and steadily freshened, stirring up latent sparks and introducing wholly new conditions.

It was No. 2 crew's time to be called, but, by the same token, it was not No. 1 crew's time to sleep under these circumstances. All hands and the cook were needed now, and for a time it was lively work. Instead of bringing discouragement the revival of the fire seemed to arouse a renewed amount of fight in the men, and by dawn they had not only conquered, but had managed to wholly clear up the leaf litter along a stretch of road to leeward and next the reservation, and, what was even more cheering, they had seen the grimy face of the warden relax into a real smile. It was evident that the battle was won. A small patrol could handle what was left. Half a dozen sentinels for another day and the incident would be closed, save for the following unromantic entry in the official returns:

Cause—Careless hunter; Acres Burned —600. Cost to Extinguish—$250. Damage—$2,000.

Hardly worthy of any greater fuss someone may think. But how about the little farming town that has to stand the cost and the loss? That is where the pinch comes.

To this particular town the bill of costs of $250 amounted to just about one-fifth of its total annual public revenue, and the loss of $2,000 worth of wood and timber on the stump meant a shrinkage of three per cent in its total assessed valuation.

But for the State's timely aid the loss to the town might have been far greater, and into the bargain the State itself stood to lose its 10,000 acre forest on Whitetop Mountain which had cost the public treasury $150,000 to purchase and develop.

The economic question naturally arises: Does the revenue from hunting licenses cover these losses?

EDITORIAL

VICTORY FOR AMENDMENT NO. 9

THE Minnesota Forestry Association achieved a great victory in the cause of forest conservation by securing the passage at the November election of constitutional amendment No. 9, which provides that such school and public lands as are better adapted for timber production than for agriculture, may be set aside as State school forests or other State forests as the Legislature may provide, and that they shall be managed on forestry principles.

The amendment was the only one of eleven which passed. The vote was 178,954 for it and 44,033 against, but as all not voting were also counted as against it the real majority was only 501.

The victory was due to a publicity campaign such as the State had never before seen, and the method by which it was conducted will well serve as an example for other States where forestry laws are needed or where amendments to existing laws are desired.

The average voter is a fair-minded individual. Show him that a proposed measure is for a real benefit for the people and the State and it will usually have his support. But he must be shown. No glittering generalities convince him. He needs cold, hard facts. He likes concrete examples. The Minnesota campaigners for Amendment No. 9 realized this. They took editors of the chief papers in the State to the north woods and showed them actual conditions following destructive lumbering on land unsuited for farming. These men were convinced. They described in their papers the conditions as they saw them. There was no gainsaying the facts and they presented the facts.

The smaller newspapers took up the work. The campaigners furnished them with daily news articles, many signed by prominent men of the State, and in this way the voters could not escape knowing what Amendment No. 9 provided and why it was needed.

So far so good. But the campaign did not stop there. The 17,000 members of the State Federation of Women's Clubs were enlisted. When women are enthusiastic about a measure and energetic in advocating it, it has advanced far on the road to success. The women distributed literature and posters and a day or two before election each telephoned one or more voters and asked them to vote for the amendment.

Still another admirable step was taken, and one that should appeal to every State or association conducting a forestry campaign. The clergy of the State were asked by their respective bishops to talk for the amendment and distribute literature. They exercised a powerful influence in its favor.

Perhaps no one feature of the campaign was more striking than the setting apart by the Governor of a State Forests Day to be observed in each school in the State. Each of the 14,000 teachers received a program and some literature and 400,000 school

children participated in exercises and took home a card asking for a vote for Amendment No. 9. What better way of reaching the home than this?

Other forms of publicity were also successful and before election day it was conceded that the defeat of the amendment was all but impossible. Yet the small majority indicated that every bit of work done for it was necessary.

A number of States need forestry laws; others should have existing forestry laws amended. None are likely to gain what is needed without agitation, without a campaign to arouse the voters. It takes money to conduct such campaigns and such money usually comes from progressive citizens of the State affected and from national associations. The American Forestry Association does all it can to aid in securing State forestry laws and encouraging the cause of forest conservation wherever possible. Unfortunately its funds are limited, as are the funds of many such organizations. It is supported by the annual dues of its members and the subscription and advertising fees for AMERICAN FORESTRY Magazine and the more members it has the more subscriptions and advertising it secures the better will it be able to render the financial assistance so much needed in arousing the public interest in the need of forestry laws.

AIDING FOREST COMMUNITIES

THERE exists, and develops into proposed legislation from time to time, some opposition to the government control and administration of the national forests. Much of this opposition is based on the claim that the forests are blocking development of the localities in which they are situated and that their resources are locked up. The Forest Service officials have long recognized that communities near national forests which are not paying taxes and which yield little or no revenue from timber sales because the forests are inaccessible, have more or less cause for complaint.

Therefore it was with considerable satisfaction that AMERICAN FORESTRY was able to publish in the December number Secretary Houston's recommendation to Congress of a plan providing that such communities be advanced money for road and bridge building and general development purposes. In this issue the details of this plan are explained by Chief Forester Graves.

If Congress adopts the recommendation of Secretary Houston, and there is every hope that it will, the effects will be felt chiefly in the great northwest and the result will be the opening up of much territory which is now a wilderness but full of latent possibilities. The plan has advantages over others for the development of the country by financial aid from the government, because it provides for repayment of the money advanced, if necessary, from the resources of the forests which will become available in the future when their timber is sold.

It is hoped that Congress will take favorable action on the recommendation at the present session.

A KNOWLEDGE OF TREES

THE American Forestry Association receives so many requests for information about the selection of shade trees for various street and soil conditions, when and how to plant them, how to protect them from insects, and repair them when injured, that such knowledge as may be generally useful to those wishing this information will be printed in a series of short, concise articles in AMERICAN FORESTRY Magazine.

The first appears in this number. It deals with the selection of shade

trees and their character. It will be found to be, in brief, readily understandable form, a compilation of answers which fit practically all inquiries about the choice of shade trees.

Next month will follow an article on how to plant them and when, with sound advice regarding their protection and care.

There is happily a noticeable growth, throughout in the entire country, of a desire to know more about trees. School children are keen to learn of them and their characteristics and many a youngster knows more about them than his parents. It is a knowledge which should be fostered. Many a city would be infinitely more attractive if it had more and better shade trees or had made better selection of those already planted. There is hardly a progressive city in the country which does not now recognize the need of a city forester or city tree commission. Arbor Day is a recognized institution. School readers contain tree stories. The public knowledge of trees and their value is growing while the public desire for the conservation of the forests is so marked that no man can deny that our citizens are at last awakened to a realization of the need for their perpetuation.

DOES FOREST FIRE PROTECTION PAY?

IF ANY one has any doubts about the value of fire protective work in the forests they will be dispelled by reading the article "The Fire protection on the National Forests in 1914," by Chief Forester Henry S. Graves, in this issue. The fact that in 1914 there were over one thousand more fires on the national forests than in the "bad year" of 1910 indicates how much greater was the danger of tremendous damage than four years ago, while the fact that in 1910 the damage was between $15,000,000 and $25,000,000, and in 1914 is was only about $450,000, indicates the wonderful progress made in the system of fire protection, and the inestimable value of such fire protection.

It is remarkable that in four short years the fire protective work could become so well systematized and its operation so perfect that, despite a large increase in the number of fires and fire conditions quite as bad if not worse, the loss should be only four per cent of what it was in 1910.

This unusual efficiency was due entirely to a systematic organization, the establishment of lookout stations from which large areas of forests could be watched, the extension of telephone lines from these lookout stations to points from which aid could be called, and the opening up of roads and trails through the forests in order to enable the fire fighters to have ready access to points where fires started. During the past four years there have been added in the development of the national forests and as fire protective measures 1,368 miles of roads, 9,617 miles of trail, 12,000 miles of telephones, 300 fully equipped lookout stations and 695 headquarters stations. So thorough was the organization and so well was the system of fire protection aided by the facilities afforded by the new roads, trails, telephones and lookout stations for fire fighters getting to the scene of a conflagration quickly, that fifty per cent of the fires were extinguished before they had reached a quarter of an acre in extent.

It might be supposed that this wonderfully good record was made by the expenditure of sums of money much larger than the amount used in 1910, but the fact is the expenditure was smaller. In 1910 over one million dollars were spent in fire fighting on practically the same area while in 1914 the expenditure for the same purpose was about $670,000.

What more effective answer than these facts could there be to the query, "Does fire protection on our forests pay"?

THE CANADIAN DEPARTMENT

By ELLWOOD WILSON

ANOTHER tragedy has been added to the long list of those which are told around the camp fires. About the sixteenth of November Mr. Lawrence S. Page, in charge of lumbering operations in the Shawenegan District for The Gres Falls Co., started into the woods with three guides. After about two weeks, as nothing was heard of them, a search was instituted and their canoe and Mr. Page's hat were found frozen in the ice in the narrows between Lac Caribou and Lac des Iles. The ice was cut out near where the canoe was found and the bodies discovered in about twelve feet of water and about twenty-five feet from shore, that of Mr. Page being about fifteen feet nearer shore than his companions. There were two long cuts in the sides of the canoe and it is probable that they were crossing the lake just at dusk, being cold and in a hurry to reach camp, and ran at a good rate of speed against the sharp shore ice and that this cut the canoe which must have filled and sunk very quickly. Encumbered with heavy clothes, numbed by the icy water and unable to climb out on the thin ice which broke under them they were unable to reach shore. Only those who have had similar experiences and escaped know the agony that must have been theirs when they found that the struggle was too much for them. Mr. Page leaves a wife and four small children.

Mr. James Lawler, Secretary of the Canadian Forestry Association, has just made a lecture trip to Grand' Mere, and Shawenegan Falls where his excellent illustrated lectures on the Forests of Canada were much enjoyed.

Mr. W. C. J. Hall, Chief of the Forest Protection Service of Quebec, has resigned from the Canadian Society of Forest Engineers.

The Canadian Society of Forest Engineers is about to become incorporated under The Ontario Companies Act, and has appointed Messrs. Jacombe, of the Dominion Forestry Service, Zavitz, Forester of Ontario, and Leavitt, Forester of the Conservation Commission, to revise and consolidate the constitution.

The report of the Commission of Conservation for 1914 is just out and is a very comprehensive and interesting volume, covering practically every subject of interest to national development. The Forestry Section reports on extensive investigations of forest conditions in British Columbia, Saskatchewan, New Brunswick and Ontario. Such matters as control of watersheds, rates of

growth, value of forest cover, natural reproduction, etc., have been carefully studied. Cooperative fire protection systems, brush disposal, railway right-of-way control have also received much attention, and very practical recommendations have been made. Town planning, infant mortality and the protection of migratory birds are among other subjects treated of.

Mr. Clyde Leavitt has just returned from his fall inspection trip of the railways in the west and northwest.

Mr. S. L. de Carteret, Forester of the Quebec & St. Maurice Industrial Co., has been to Berlin, N. H., to attend the annual meeting of the Woods Department of the Berlin Mills and other allied companies. These gatherings, the idea of Mr. W. R. Brown, are a great help in bringing together men who are working for the same concern but from the nature of their work are seldom able to get together. It develops an *esprit de corps* and enables men to swap experiences, to see other methods of work and to get out of the rut and realize that there are others with the same problems and difficulties.

The Government of Quebec has increased the appropriation to the Government Forestry School affiliated with Laval University to $8,000 per annum, which will enable many extensions to the courses. Mr. Piché, the Chief Forester, reports that his Department was engaged during July, August and September in the classification of Government lands and the inspection of settler's lots. Twelve parties were in the field besides isolated rangers, who were inspecting wood working establishments or watching the movement of timber along the railways. Their activities are now engaged in the inspection of logging operations which at present are much hampered by lack of snow.

Mr. W. J. Boyd, of the Dominion Forest Service, has just returned from a long trip from Prince Albert, Sask., beginning on May 15th last, by way of the Clearwater, Athabasca and the Mackenzie Rivers to the Arctic Circle, thence by way of the Rat River over the MacDougall Pass into the Bell River, the Porcupine and the Yukon to Fort Yukon in Alaska, then up the Yukon to Dawson and out by way of the White Pass. Mr. E. S. Davidson accompanied Mr. Boyd and for over two thousand miles they traveled without guides. The timber conditions were observed and much valuable information obtained and the whole trip made without any mishap.

Algonquin Park, a forest reserve of the people of Ontario, consisting of about 1,750,000 acres, roughly about fifty miles on a side, covers the source of a number of important streams. It is a game refuge and the wild animals have increased to such an extent that it has been necessary to remove some of them. The Government are trapping and selling a number of fur-bearing animals, especially beaver, and of these latter are killing and selling quite a number of skins annually. Anyone wishing these animals can obtain them from the Ontario Government at the following rates: per pair, mink, $35.00; beaver, $50.00; marten, $80.00; fisher, $80.00; otter, $150.00.

Probably the first jail sentence ever given against a man for setting a forest fire has just been awarded in Quebec. This will be a great step in helping to protect the forests from fire for hitherto the offense has not been considered serious and the judges and magistrates have generally refused even to fine a man especially if he belonged to the right political party. A better day is dawning.

The St. Maurice Forest Protective Association has reported that for the season just ended, the worst season in its history, 814,468 acres were burned over, 4,600 acres merchantable timber, 7,935 acres of old slash, 50,958 acres of old burn, and 17,975 acres of young growth. The total area patrolled was 8,132,416 acres. The chief causes of fires were river drivers and the contractors for the new Transcontinental

Railway, the worst fire being set by these latter's section men burning old ties.

Mr. John Gillies, of the firm of Gillies Brothers, and one of the best known residents of the Ottawa Valley, died on Nov. 17th. He was in charge of the woods operations of his firm and was early distressed at the inadequate care taken of her forests by Canada. He it was who protested so strenuously at the time of the Cobalt boom, at the throwing open of his firm's timber limits to destruction by the prospectors.

After a long illness the Hon. Colin H. Campbell, former Minister of Public Works and Attorney General of Manitoba, died in Winnipeg. Mr. Campbell represented the Manitoba Government at the Canadian Forestry Association meeting, held in Victoria, B. C., and was so impressed by the need of conservation that he urged the Manitoba Government to issue the invitation to the Association to hold the 1913 Convention in Winnipeg.

Mr. Henry Sorgius, Manager of the St. Maurice Forest Protective Association, was married about three weeks ago. Mr. Sorgius has been with the Association since its inception and has done most excellent work.

The Laurentide Co., Ltd., is finding trouble in its plantations with the hares, which eat off the terminal shoots of the young spruce and balsam trees, causing them to grow bushy. They do this mostly in the fall and spring and are a great nuisance.

IN BRITISH COLUMBIA

THE Province of British Columbia is divided into eleven administrative districts, each one with its force consisting of a District Forester, under whom work rangers, scalers, forest assistants and guards. The guards are employed only during the fire season in summer, and their work is directly supervised by the rangers, one ranger overseeing a number of guards.

The total force of the Forest Branch during the height of the fire season in August was over 500, of whom nearly 350 were employed solely in fire protection. In addition were about 25 officials as chiefs of police in municipalities, construction foremen, etc., who were appointed and acted as forest guards without pay for the Forest Branch.

On the railways under Dominion Charter, as the C. P. R., G. T. P., G. N. R., about 50 special fire patrolmen were employed by the railways besides the hundreds of section men, etc., a part of whose duties is fire protection. As officers of the Board of Railway Commissioners for Canada, the officers of the British Columbia Forest Branch supervise fire protection on the railways.

On the railways as the C. N. P. and P. G. E., under Provincial Charter the forest officers, by virtue of the British Columbia Forest Act, have even closer control of fire protection, and here the patrolmen are appointed and paid by the Forest Branch, the cost being recovered from the railroad at the end of the season.

The Dominion Forestry Branch, Crown Timber Branch, and Dominion Parks Branch employ 50 to 75 rangers and guards in the Dominion Railway Belt during the summer. Over 40 of the men were appointed acting forest guards in the British Columbia Forest Branch this year for the purpose of giving them authority to issue burning permits.

A number of private forest guards are employed in different parts of the Province by owners of large bodies of valuable timber.

Altogether in midsummer the British Columbia Forest Branch and other forest protective organizations employed over 500 men on special protection work.

Altogether there were in the Province over 1,000 whose duties were in whole or in part fire protection.

The fire season in British Columbia, 1914, was, as regards dry weather and hazard, the worst for many years. Old inhabitants say that there was not another so dry summer this century, nor in fact since the 80's. The expenditure in fire fighting was very heavy but justified, for considering the very large number of fires and the extraordinary hazardous conditions, the amount of merchantable timber and other property destroyed is remarkably small—much smaller than in the Pacific States where the fire season was also very bad.

Figures so far available are given below. It should be remembered these are as yet only approximate; the final figures will probably exceed these somewhat.

Total number of fires over 1,500, of which over 400 cost money to fight. Total cost fire fighting over $150,000.

Total area burned over—over 350,000 acres, of which over 250,000 acres was old burn or slash, over 50,000 was valuable second growth, over 20,000 was merchantable timber, over 30,000 was range land.

Over 70 millions feet board measure, merchantable timber destroyed, of which one-fifth estimated salvageable.

Over 400 miles of fire trail were built in fighting fires during the summer.

An outstanding feature of the fire season was the valuable cooperation given to the forest officers by the people at large. It is doubtful if anywhere else in Canada there exists as close and effective a cooperation in forest protection as in British Columbia. One reason for that is that British Columbia is so universally forested and the utilization of those forests so important to her, that their fate does and always will vitally concern a very large part of her population and her industries. The railway, mining, irrigation, power, lumber, etc., companies are all more or less dependent on the forests and forest products for their existence and operation. They show their appreciation of this by the keen interest they manifest in fire protection and the ready assistance they give the forest officers.

It was shown that the only way to make logging or other slash really safe is to burn it under control in not too dry weather. Otherwise the slash is a constant hazard during dry weather and sooner or later it results in an expensive and often destructive fire.

The permit system again proved its great value and necessity. During August and the first week of September in the southern part of the Province at least, permits were cancelled and no burning allowed in or adjacent to the forests, except under the strictest safeguards. Were it not for this control by the Forest Branch of burning during the fire season, fire protection would be almost impossible.

Quite a number of prosecutions were made for violation of the fire law and convictions secured. The policy followed is to deal leniently with the unknowing offender, but to make example of the wilful lawbreaker.

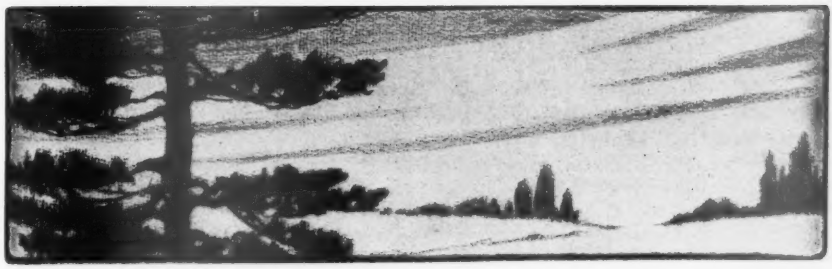
IMPROVEMENTS

In spite of the bad season the Forest Branch was able to do a considerable amount of permanent improvement work during the summer, in extension chiefly of last year's projects. The telephone line up the Columbia River from Revelstoke was completed to Big Bend or Boat encampment opposite the mouth of the Canal River, the total distance now being 120 miles. Another line which connects up some of the Island to the north of the Gulf of Georgia was extended, the total length now being 65 miles. Still another line was built 20 miles up the Upper Kootenay River above Canal Flats. Over 75 miles of trail have been constructed in different parts of the Province. A number of cabins, boat houses, lookout stations and tool caches have been built.

GRAZING

British Columbia possesses great areas of summer range mostly more or less wooded and nearly all of it Crown lands.

A grazing investigation is now being carried on to determine the proper policy and methods to be adopted to encourage the fullest possible utilization of the immense amount of forage now going to waste each year.



FOREST NOTES

The Sihlwald, or city forest of Zurich, Switzerland, adds to the town's revenues $7.20 per acre a year, reducing the amount needed to be raised through taxation by more than $32,000.

In northern Idaho and Montana, which had many fires during the past summer, 35 per cent of the fires on national forests were caused by railroads, 26 per cent by lightning, and 10 per cent by campers. The remainder were due to brush burning and other miscellaneous or unknown causes.

A mountain lion recently killed in the Grand Canyon game preserve, which adjoins the Tusayan national forest, measured ten feet from nose to tail. Mountain lions and other beasts of prey, such as wolves, coyotes, and wild cats, are killed by forest officers and game wardens because they are a menace to stock and to game animals.

In the course of investigations of the wood distillation industry of New York by the College of Forestry at Syracuse, it finds that the removal of the tariff on grain alcohol has hurt the market on wood alcohol in such a way as to make it hardly profitable to produce wood alcohol at this time. The chief products of the destructive distillation of wood are charcoal, wood alcohol and acetate of lime. Charcoal is used for gun powder, for fuel, in the manufacture of iron, and for various poultry and animal foods. Acetate of lime is used almost wholly in the dye industries. Wood alcohol is used largely as a solvent and for various chemical purposes. Beech, birch and maple are the best woods for the production of wood distillation products. Heartwood is better than sapwood because it does not contain so large a percentage of moisture. Elm, chestnut and cherry are not desirable woods for the wood distillation industry because they contain too much tannin, gums, etc.

J. J. Crumley, the secretary of the Ohio State Forestry Society, who is also Assistant Forester at the State Experiment Station, believes in practicing what he preaches. As soon as he engaged in his present position, he went to the southern part of the state and bought some hill land suitable only for forestry purposes. During the first two succeeding summers, he took his family of four and spent his summer vacations on this land, and combined delightful summer outings with the launching of his plan of improvement, cutting in culled over woodlands and reforesting vacant spaces. Up to date, he has most of the vacant spaces reforested; and by removing the old culls, the "left overs" from successive lumbering operations, he has given the more valuable young material opportunity to occupy the ground and air space. Incidentally he has marketed from this improvement cutting 60,000 feet of lumber, four car loads of locust posts, and fifty crossties. The net value of these products was about $1,000. He paid $1,600 for the place and has left the land, the finest young timber, his buildings, and small orchard.

When he gets this place improved and restocked, he proposes to buy another and keep at it.

Of two million sheep annually grazed in the State of Utah, more than a million are on the National Forests, or, including lambs which are fattening for market on the forest ranges, over a million and three-quarters.

Dr. Harry P. Brown, Assistant Professor of Forest Botany in The New York State College of Forestry, has published a paper in the January number of Mycologia treating of a peculiar timber rot of oak and chestnut. The decay is caused by Hymenochaete rubiginosa (Sch.) Lev. The rot first manifests itself through the formation of white areas in the wood, separated by sound tissue. Later, pockets are formed which have a white lining. The decay is quite similar to that of oak caused by Stereum frustulosum (pers.) Fr.

The Boise national forest in Idaho had 30 fires during the past summer, yet 28 were held down to less than 10 acres, and of these 15 were less than one-quarter of an acre. The supervisor says this success was due to a lookout tower, and to efficient telephone and heliograph service.

Because of the war, English manufacturers and consumers of wood pulp have been caused considerable uneasiness. Production is at a standstill in the countries at war, and in Norway and Sweden, principal sources of supply, mills have been greatly hampered because of a lack of coal and of chemicals. England has practically no domestic sources of pulp.

Black Hills white spruce has entered the market as a commercial possibility. After a series of experiments the spruce has proven itself of value for mining timbers in the coal mines of Cambria, Wyoming, and as a result several mining timber contractors have entered into contracts with the Forest Service for the purchase of white spruce from the Black Hills National Forest.

The Department of Forest Botany at The New York State College of Forestry is engaged in the classifying of the collections of forest fungi which were secured at the Summer Camp of 1914 in the Catskills. Diseased plants fungi and specimens of wood which show fungous decay are being prepared for museum purposes and for studies in connection with the decay of timber.

The forest fire season in the 28 square miles included within the boundaries of the city of Fitchburg, Mass., ended November 14. For the twelve months preceding this date the precipitation was 13 inches less than the normal. A continuous drought occurred beginning late in August and lasting 47 days. During the entire season there occurred 69 fires in the timber, sprout and brush lands of the outlying districts. The total area burned amounted to 127 acres. The cost of extinction was $649.-71. The entire fire damage amounted to $44.00. All fires were extinguished by expert forest protective methods, most of them before they exceeded the light surface stage. Fires that developed into deep ground burns or into top fires were kept absolutely restricted to very small areas until entirely extinguished.

The annual meeting of the Massachusetts Forestry Association held in Boston on December 10 was very well attended. The Association honored Mr. Allen Chamberlain by making him a patron, the fee of $1,000 being contributed in small amounts by about two hundred members in recognition of Mr. Chamberlain's admirable work for forest conservation. Interesting addresses were delivered by Mr. Chamberlain on the present status of the new national forest in New Hampshire; by Arthur A. Shurtleff on the Esthetic and Recreational Possibilities of Town Forests; by Secretary Harris A. Reynolds on Economics of Town Forests and by Wm. W. Colton on the management and Development of the Town Forest. The officers elected are: President, Nathaniel T. Kidder of Milton; vice-presidents, Berkshire—Heloise Meyer, Lenox; Bristol—William E. Fuller, Jr., Fall River;

Essex—Benjamin S. Johnson, Lynn; Franklin—W. B. Gaines, Greenfield; Hampden—Samuel Bowles, Springfield; Hampshire—Kenyon L. Butterfield, Amherst; Middlesex—Mrs. Fred H. Tucker, Newton; Norfolk—S. M. Weld, Dedham; Plymouth—G. R. Briggs, Plymouth; Suffolk—Edwin D. Mead, Boston; Worcester—John E. Thayer, Lancaster; Secretary, Harris A. Reynolds, of Cambridge; Treasurer, Ernest B. Dane of Brookline; members of the executive committee, Frank A. Cutting of Winchester; William P. Wharton of Groton; John S. Ames of North Easton; trustee of the permanent fund, George N. Whipple of Boston; auditor, H. Wadsworth Hight of Winchester.

Dr. L. H. Pennington, Assistant Professor of Forest Pathology of The New York State College of Forestry, is just completing the manuscript of a monograph of the temperate species of the genus Marasumis for publication in North American Flora.

The New York State College of Forestry took over the College publication for one issue and has issued the Forestry Number of the Syracuse Orange. This edition contained a great deal of data relating to Forestry in New York State and the growth of the institution in particular.

One of the most important resolutions passed at the annual meeting of the Western Forestry and Conservation Association at Tacoma, Wash., in December was the following:

"In view of the heavy expenses for fire fighting the past season both on private and National Forest lands, and since such expenses have resulted in the Federal Service expending an amount in excess of its emergency appropriation for this purpose, we urge upon Congress the need for such emergency appropriation as will fully cover the deficit incurred and for a liberal reserve emergency fund in the future. We also urge that the government refrain from considering either this or the regular annual appropriation for national forest protection as calling for any radical attempt—especiall during periods of market depression when such a policy would effect further community injury, waste and utimate loss to nation and to consumer—to force the disposal of national forest timber for purposes of immediate compensatory revenue."

In addition to his own fire detection system, the supervisor of the Palisade national forest, Idaho, was notified of each fire by from five to ten different local settlers, who thus showed their cooperation in working for fire suppression.

The Uinta mountains of Utah, included within the Wasatch, Uinta, and Ashley national forests, should become a favorite recreation region, because of the many small lakes within depressions scooped out by glacial drifts. Seventy such lakes can be counted from Reid's Peak, and one particular township, 36 miles square, contains more than a hundred.

The Chilian Congress is seriously discussing a revision of the forestry laws of that country, with a view to preserving the large area of forests now in existence, and to increasing them in the arid portions of the country north of Valparaiso. In the last few years large areas of forest lands have been cleared for agricultural purposes, and this clearing is still going on.

Forest fires in Pennsylvania in 1914 caused damage estimated at more than $450,000, according to a summary made up by the State Department of forestry. The summary shows that 241,486 acres were burned over and that it cost the state more than $16,000 to extinguish the fires.

Uses of Black Locust

Outside of its use for fence posts, black locust finds its principal utilization in insulator pins and brackets for telegraph and telephone lines.

FOREST EDUCATION IN MARYLAND

DURING the past summer and fall the Maryland State Board of Forestry has carried on throughout Maryland an educational campaign in the interest of good forestry and better forest management. Part of this work has consisted of lectures and illustrated talks, by the State Forester and his Assistant, which have been given before local granges, schools and clubs. The farmers, who are the largest holders of woodland in Maryland, as elsewhere in the East, have been reached by a series of exhibits and demonstrations at the leading State and county fairs. With them the State has been thoroughly covered, and the value of both private and State forestry brought home to the class of people who own the forests.

In November, during Maryland Week, the last exhibit of the year was given in the Fifth Regiment Armory at Baltimore. The Board of Forestry has for many years been an exhibitor at the Horticultural Show held then, each year featuring some one important phase of its work. A year ago the exhibit was of forest products, but at the show just past it was the intention to give particular emphasis to the reforestation of the State's waste lands and the improvement of her highways under the recently enacted law regarding roadside trees. To this end beds of seedlings were shown beside larger ones where the work of outplanting was well represented with transplant trees adapted to growth in the State. The stock exhibited was from the State Forest Nursery at College Park, where nearly a quarter-million small trees have been growing since its establishment less than a year ago. Along these beds of trees ran a roadway which might serve as a model for highways in the State. The road was carefully constructed and laid out, but it was to the trees which lined it in two long rows that attention was especially directed. The roadside trees, like the road, were on a somewhat reduced scale, but the same proportion was observed throughout. The trees themselves were well trimmed and symmetrical, giving emphasis to work under the new Roadside Tree Law. Tree Wardens from the State Forester's Office have supervised the trimming of 10,000 trees since July 15, 1914. This takes no account of the work done in Baltimore City under a separate Department. The new law has worked out well, and has already accomplished much in the way of improving publicly owned trees and making the highways of Maryland more attractive.

CURRENT LITERATURE

MONTHLY LIST FOR DECEMBER, 1914.

(Books and periodicals indexed in the Library of the United States Forest Service.)

Forestry as a Whole.

Proceedings and reports of associations, fores officers, etc.

Bavaria—K. Staatsministerium der finanzen. Ministerial-forstabteilung. Mitteilungen aus der staatsforstver-waltung Bayerns, heft 15. 165 p. München, 1913.

Society of American foresters. Proceedings, v. 9, no. 4. 97 p. Wash., D. C., 1914.

Vermont—State forester. Sixth annual report. 63 p. pl. Burlington, Vt., 1914.

Forest Aesthetics

Street and park trees

Buffalo—Park commissioners. Forty-fifth annual report. 48 p. Buffalo, 1914.

St. Louis—City forester. Annual report for the fiscal year ending April 7, 1913. 5 p. St. Louis, 1913.

Forest Education

Forest schools

University of Minnesota—College of forestry. Announcement, 1913-14. 20 p. map. Minneapolis, Minn., 1914.

Forest Description

Harper, Roland M. The coniferous forests of eastern North America. 24 p. il. N. Y., Science press, 1914.

Rübel, Eduard A. The forests of the western Caucasus. 4 p. pl. Cambridge, Eng., University press, 1914.

Forest Botany

Trees: classification and description

Lamb, William H. A conspectus of North American firs (exclusive of Mexico). 11 p. il. Wash., D. C. Society of American foresters, 1914.

Neger, F. W. Die laubhölzer. 160 p. il. Berlin and Leipzig, G. J. Göschen, 1914.

Winkenwerder, Hugo. Short keys to the trees of Oregon and Washington. 3d ed. 16 p. Seattle, Wash., University of Washington, 1914.

Silvics

Studies of species

Woolsey, Theodore S., Jr., and Chapman, Herman H. Norway pine in the lake states. 42 p. pl. Wash., D. C., 1914. (U. S.—Department of agriculture. Bulletin 139.)

Forest Protection

Insects

Stebbing, Edward Percy. Indian forest insects of economic importance. Coleoptera. 148 p. il., pl. London, Eyre & Spottes-woode, 1914.

Forest Management

Roth, Filibert. Forest regulation or, The preparation and development of forest working plans. 218 p. maps. Ann Arbor, Mich., published by the author, 1914. (Vol. 1 of Michigan manual of forestry.)

Forest Economics

Statistics

California—State board of agriculture. California forests; the lumber industry. 8 p. Sacramento, Cal., 1914.

Lewis, R. G., comp. Forest products of Canada, 1913: poles and cross-ties. 16 p. Ottawa, 1914. (Canada—Dept. of the interior—Forestry branch. Bulletin 47.)

Lewis, R. G., comp. Forest products of Canada, 1913: pulpwood. 17 p. map. Ottawa, 1914. (Canada—Dept. of the interior—Forestry branch. Bulletin 46.)

Forest Administration

United States—Dept. of agriculture—Forest service. Instructions for appraising stumpage on national forests. 70 p. Wash., D. C., 1914.

United States—Dept. of agriculture—Forest service. Report of the forester, 1913-14. 36 p. Wash., D. C., 1914.

National and state forests

United States—Dept. of agriculture—Forest service. National forest areas, June 30, 1914. 8 p. map. Wash., D. C., 1914.

Forest Utilization

Wood preservation

Goltra, Wm. Francis. The preservation of ties, poles and timbers by antiseptic treatment. 11 p. Cleveland, O., 1914.

Auxiliary Subjects

Natural resources

Argentine Republic—Ministry of Public works. Northern Patagonia: character and resources. v. 1 and atlas. pl., maps. N. Y., Scribner press, 1914.

Canada—Commission of conservation. Report of the fifth annual meeting held at Ottawa Jan. 20-21, 1914. 287 p. pl. Toronto, 1914.

Botany

Hole, R. S. Development of the culms of grasses. 13 p. Calcutta, 1914. (India—Forest dept. Forest bulletin no. 25.)

Landscape gardening

Miller, Wilhelm. Practical help on landscape gardening. il. Urbana, Ill., 1914. (Illinois—Agricultural experiment station. Circular 176.)

Hydrography

Horton, A. H. Water resources of Illinois. 400 p. pl., map, diagr. Springfield, Ill. Rivers and lakes commission, 1914.

Maine—State water storage commission. Fourth annual report, 1913. 323 p. Waterville, N. Y., 1914.

Commerce

Norway—Statistiska centralbyraa. Norges handel, 1912. 337 p. Kristiania, 1913. (Norges officielle statistik, v. 208.)

Periodical Articles

Miscellaneous articles

American city, Oct., 1914.—Town forests; a European idea by which America might profit, by H. A. Reynolds, p. 310-14.

Bulletin of the Torrey botanical club, Nov., 1914.—A superficial study of the pine-barren vegetation of Mississippi, by Roland M. Harper, p. 551-67; The production of paper from bamboo, p. 653-4.

Garden magazine, Oct., 1914.—Starting right with fall set trees and shrubs, by F. F. Rockwell, p. 81-3.

Gardeners' chronicle, Nov. 7, 1914.—Curpessus torulosa, by A. Bruce Jackson, p. 305.

Gardeners' chronicle, Nov. 14, 1914.—Dwarf conifers for the rock garden, by J. Clark, p. 320; The ringing of trees, by L. A. Boodle, p. 320-1.

Life and health, Sept., 1914.—Forestry for health seekers, by Hal Ross, p. 401-3.

National wool grower, Nov., 1914.—The forests and their users, by L. F. Kneipp, p. 16-20.

Petermanns mitteilungen, Sept., 1914.—Die verbreitung des waldes in Europa, by J. Riedel, p. 128-31.

Reclamation record, Dec., 1914.—Tree planting: Boise and Minidoka projects, p. 464-5.

Scientific American, Nov. 14, 1914.—Ocean-going log rafts, by J. F. Springer, p. 401; Forest fire fighting; construction of a 115-foot watch-tower with limited equipment, p. 405.

Scientific American supplement, Oct. 17, 1914.—Climatic influences of forests, by L. A. Fosbery, p. 246-7.

Scientific American supplement, Oct. 31, 1914.—Nodon electrical process of wood preservation, p. 286.

Southern good roads, Nov., 1914.—The Appalachian park movement as related to roads, by George N. Powell, p. 15-16.

United States—Dept. of agriculture. Journal of agricultural research, Nov., 1914.—Natural revegetation of range lands based upon growth requirements and life history of the vegetation, by Arthur W. Sampson, p. 93-147.

Trade journals and consular reports

American lumberman, Nov. 14, 1914.—The mangroves and their uses, p. 52.

American lumberman, Nov. 21, 1914.—What is the matter with the lumber industry, by H. S. Graves, p. 35.

American lumberman, Nov. 28, 1914.—Forest fires in the northwest, p. 24; Present and prospective trade in Chile, by Harold Buxton, p. 26; Sanitary portable logging camp in Washington, p. 36; Trees associated with many historic events, by Eugene Parsons, p. 48-9.

American lumberman, Dec. 12, 1914.—Fine work of Forest service; record made in fighting forest fires, p. 38-9.

Barrel and box, Nov., 1914.—The several gums as box material; red gum, p. 37; Argentine's forest resources, by William Dawson, p. 44.

Canada lumberman, Dec. 1, 1914.—Growth of the lumber industry in B. C., by R. H. Alexander, p. 34-5.

Engineering magazine, Oct., 1914.—Durability of creosoted piling, by N. A. Bowers, p. 115-17.

Engineering magazine, Nov., 1914.—Railway tie-treating plant, p. 255-8.

Engineering news, Sept. 24, 1914.—Tie treating plant, Louisville and Nashville R. R., p. 622-6; Stump pulling machine for clearing land, p. 642-3; The creosote oil situation and the treatment of crossties, by S. R. Church, p. 658-9.

Engineering news, Oct. 29, 1914.—Effect of creosoting on strength of Oregon fir piling, by H. B. Macfarland, p. 863; A new type of creosoting plant, p. 877.

Engineering record, Oct. 3, 1914.—Applicability of yellow pine grading rules to other timbers, by J. A. Newlin, p. 387.

Gulf Coast lumberman, Nov. 15, 1914.—Forestry laws of Texas, p. 34.

Hardwood record, Nov. 25, 1914.—The greenheart industry, by C. D. Mell, p. 23-6; Shipbuilding and lumber, p. 28; Lead pencils and penholders, p. 32.

Hardwood record, Dec. 10, 1914.—The disappearing chestnut, p. 23-4; Some new kiln-drying thoughts, by Henry Hunter, p. 31; Aggressive and cowardly trees, p. 33; Turkish boxwood, p. 42.

Journal of electricity, power and gas, Nov. 7, 1914.—The purposes of national forests and their protection, by Charles H. Flory, p. 437-9.

Journal of electricity, power and gas, Nov. 21, 1914.—Producer gas from wood, p. 472.

Journal of industrial and engineering chemistry, Sept., 1914.—Chemistry of pine oil, by M. Toch, p. 720-3; Oils of the coniferae, by A. W. Schorger, p. 723-7.

Lumber trade journal, Nov. 15, 1914.—Philippine forestry director compiles descriptive list of commercial hardwoods, p. 35-6.

Lumber world review, Nov. 25, 1914.—What does it cost to manufacture your lumber, by R. B. Goodman, p. 23-5; Random remarks about wood preservatives, E. A. Sterling, p. 28-30.

Lumber world review, Dec. 10, 1914.—Scientific experiments in painting cypress, by Hermann von Schrenk, p. 25-6; National lumber manufacturers' association October report of production and movement of lumber, p. 29.

Mississippi Valley lumberman, Nov. 13, 1914.—Fire prevention through creation of public sentiment, by E. T. Allen, p. 42.

Paper, Nov. 18, 1914.—Chemical pulp for sausage casing, by W. P. Cohoe, and others p. 20-21; Lumbermen and papermakers

in session; 9th annual convention of the Empire state forest products association, Nov. 12, 1914, p. 24-6.

Paper, Dec. 9, 1914.—Forest conservation and power problems, by E. N. Smith, p. 15-16.

Pioneer western lumberman, Nov. 15, 1914.—The people, the forests and the lumber industry, by H. S. Graves, p. 9; Taxation, by E. T. Allen, p. 11; Steam distillation of needles, twigs and cones of western conifers, by George M. Hunt, p. 19-22; Growth of Douglas fir, p. 32.

Pioneer western lumberman, Dec. 1, 1914.—The silo, by H. L. Fisher, p. 19.

Pulp and paper magazine, Nov. 1, 1914.—Norwegian wood pulp, cellulose and paper industry, by N. W. Rogstad, p. 620-7; Reinforced concrete log chute and dam, Quebec, by Frederick Davy, p. 628-30.

St. Louis lumberman, Dec. 1, 1914.—The forest resources of Chile, by Frank G. Carpenter, p. 31; Sugi cypress in bar fixtures, p. 76-7.

Timber trade journal, Nov. 7, 1914.—The Trafalgar pine, by A. D. Webster, p. 686.

Timber trade journal, Nov. 14, 1914.—The collection of forest seeds, p. 724.

Timberman, Oct., 1914.—Standardizing yellow pine, by O. T. Swan, p. 23-4; Ring rule applied to fir, by J. B. Knapp, p. 24; Hardwoods of Honduras, by Clyde R. Dillabaugh, p. 33; Logging on island of Formosa, by F. W. Chiswell, p. 34-5; Some problems connected with national forests, by H. S. Graves, p. 39; Lumber cut of the United States, 1911, 1912 and 1913, p. 58.

Timberman, Nov., 1914.—Compilation of specific data on lumber consumption for various uses, by H. S. Graves, p. 26-7; Inland empire timber, by A. W. Cooper, p. 35-6; The topographic map, by Newell L. Wright, p. 41-2; Training for the lumber business, p. 47-8; Lumbering in the Philippine Islands, by L. Murray Lamm, p. 48A; Review northwest fires, p. 48C-D.

United States daily consular report, Nov. 24, 1914.—Lumber markets of the territory of Hawaii, by Franklin H. Smith, p. 881-90.

United States daily consular report, Dec. 15, 1914.—The Greek timber market, by Alexander W. Weddell, p. 1168.

West Coast lumberman, Nov. 15, 1914.—Two hundred ninety-two billion feet of timber in the national forests of Alaska, Washington and Oregon, p. 25; Closer utilization of lumber in silo building worked out by Tacoma man, p. 29; Utilization of wood waste, p. 29.

West Coast lumberman, Dec. 1, 1914.—Worth of Seattle's new wood block paving quickly acknowledged, p. 24; Forest products laboratory researches affecting west coast woods, by Howard F. Weiss, p. 36, 39.

Forest journals

Bulletin of the New York state forestry association, Oct., 1914.—State forest administration with particular reference to the state of New York, by James W. Toumey, p. 5-10; A discussion of Art. 7, Sec. 7, of the state constitution, by George N. Ostrander, p. 11-14; What is a timber sale like, national forest cuttings, by A. B. Recknagel, p. 15-16; The forestry provisions of the New York state constitution, by Samuel H. Ordway, p. 18-20; The Massachusetts forestry association, its work and policy, by Harris A. Reynolds, p. 21-6; Why we have made progress in New Hampshire, by Philip W. Ayres, p. 27; A reply to certain statements relative to the state forest preserve, by F. A. Gaylord, p. 31-9; Constitutional amendment affecting the Adirondacks, by Kenneth W. Goldthwaite, p. 40-1.

Canadian forestry journal, Dec., 1914.—Douglas, the man and the tree; romantic life of the man after whom the Douglas fir was named, p. 118-19; Animals in Algonquin park, p. 119-20.

Hawaiian forester and agriculturist, Oct., 1914.—Forest reserve matters, by Ralph S. Hosmer, p. 300-3.

Indian forest records, 1914.—Oecology of sal, by R. S. Hole, p. 1-40.

North woods, Nov., 1914.—A time for rejoicing and more work; the state forests amendment to the constitution passed, p. 3-4, 7-12; The forest school at Itasca, p. 19-20; French forests in the war zone, by Samuel T. Dana, p. 22-5.

Zeitschrift für forst- und jagdwesen, Aug., 1914.—Jahrring und licht, by Oelkers, p. 455-72; Untersuchungen in mischbeständen, by A. Schwappach, p. 472-91.

Zeitschrift für forst- und jagdwesen, Sept., 1914.—Zur umtriebsbestimmung der wälder, by Hans Hönlinger, p. 538-49.

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